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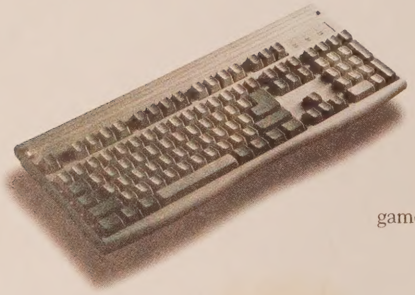

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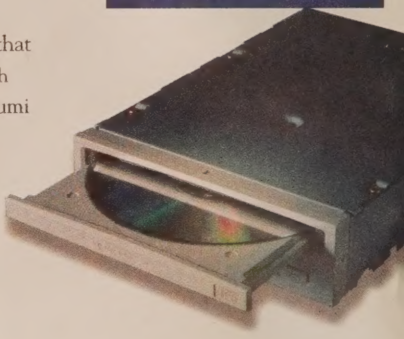

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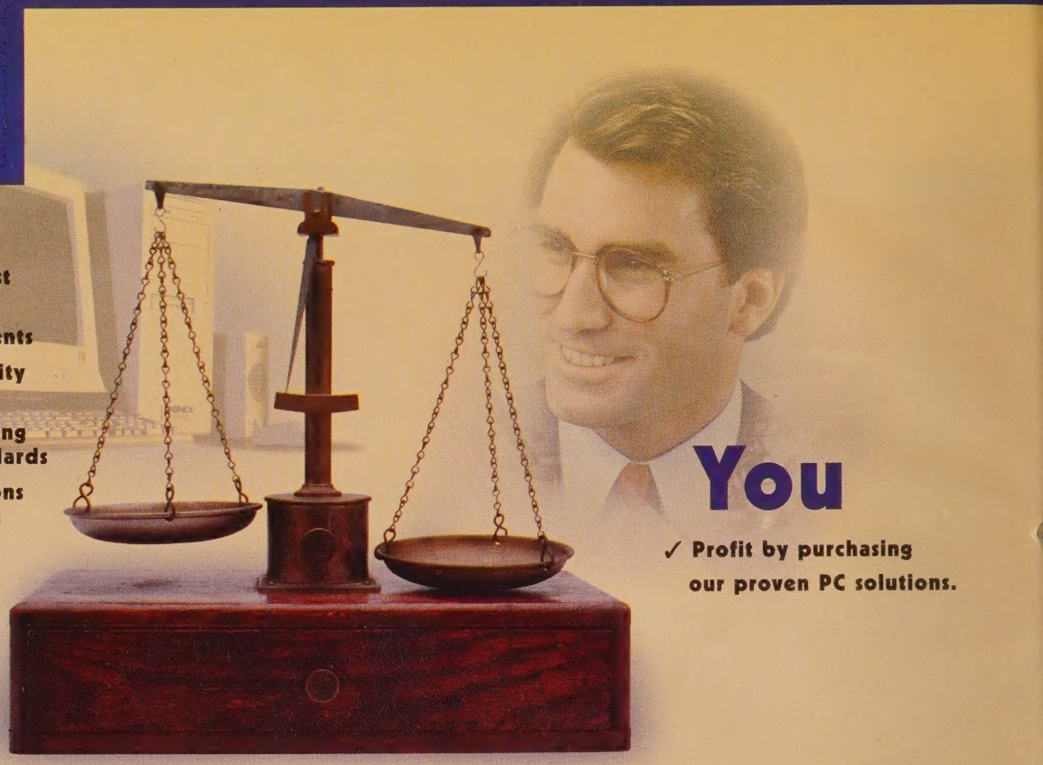

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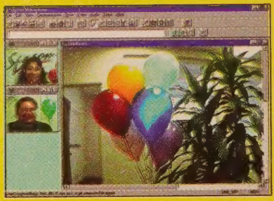
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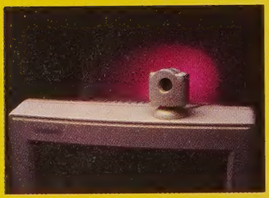

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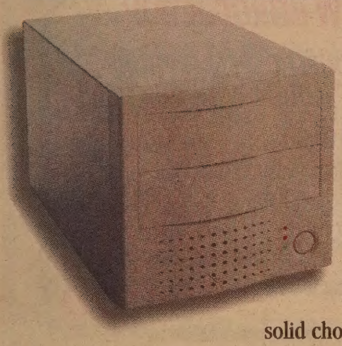

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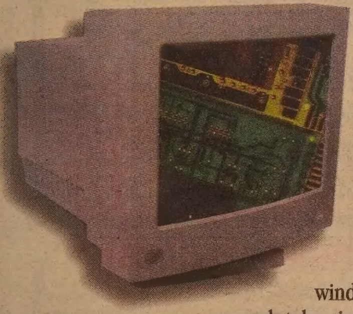

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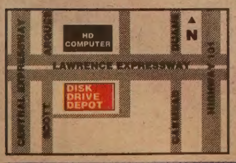

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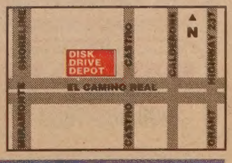

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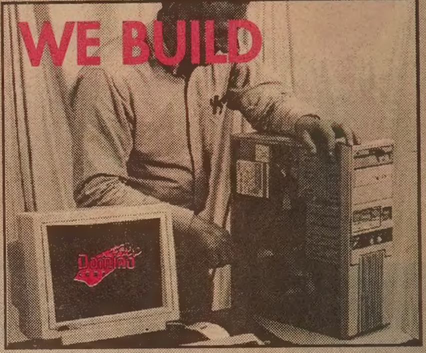

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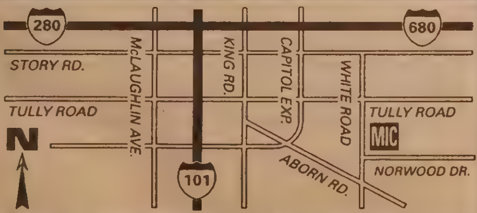

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Test-drive a great color scanner

The Envisions Scanner Outlet is the only store in the Bay Area that specializes in scanners, so we have the answers to your tough scanning and graphics questions. Stop by our Santa Clara store to test drive a scanner and find out how you can add color images to your documents quickly and easily with a color scanner from Umax.

Envisions Scanner Outlet Deal of the Month!

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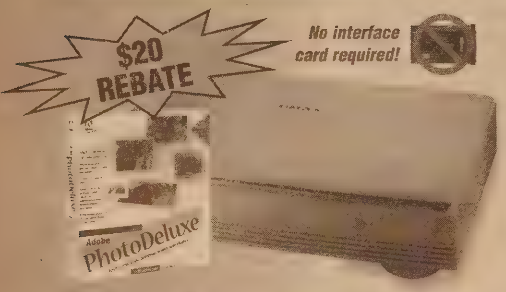
Umax Gemini, Trans Adapter & Photoshop 4.0!

The Umax Gemini D16 scanner has long been a favorite of graphics pros because it offered 800dpi maximum optical resolution, 30-bit color, and a transparency adapter (for slides and film), all for under $1,500. We bought the last batch of Geminis the Umax factory ever made, and now we're closing them out at $999. To sweeten the deal, we're even throwing in a free copy of Photoshop 4.0! Hurry, when these Geminis are gone, they're gone forever!



Our simplest color scanner, just $178!

The easy-to-use Umax Astra 300P

For those who put ease of installation at the top of the list, Umax has the perfect solution. The new Astra 300P is a great color flatbed that plugs into your PC's parallel port, so you don't need to install an interface card or learn anything about SCSI in order to set it up.

In fact, the Astra 300P can be installed in under three minutes. It's so simple, it even takes up less desk space — it's just 16" x 12" x 3". The Astra 300P also weighs in at just 8 lbs., so it's light enough for anyone to take on the road.

Like its more expensive sisters, though, the Astra 300P uses the same high-quality optics that have made Umax the 1997 Editors' Choice at both *PC Magazine* and *Macworld*. The Astra 300P also comes as a complete scanning system, including Adobe PhotoDeluxe for scanning, editing, and printing photos; Wordlinx OCR for converting text; and drivers for Windows 3.1 & Windows 95.

Umax Astra 300P Complete Scanning System (Reg. $249)	**$199***
Umax Astra 300P System with Adobe Photoshop 4.0	**$499***

** Includes $20 rebate from the manufacturer*

SAVE $50!
Adobe Photo

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The best-selling Umax Astra 600S

Umax sets a new standard for scanners with the Astra 600S, the only scanner in its price range with 30-bit color and a legal-sized scanning bed. The Astra 600S uses the same high-quality optics that have made Umax the 1997 Editors' Choice at both *PC Magazine* and *Macworld*.

With the Astra 600S, you'll be able to add graphics to everything you produce on your PC. You can scan color photographs at 300dpi and add them to ads, brochures, and catalogs, or use them to spice up your web site. The 600S is also perfect for scanning in text from letters, invoices, and other paperwork. With the included OCR software, you'll be able to save hours of typing time.

The Astra 600S comes as a complete scanning system, with Adobe PhotoDeluxe for scanning, editing, and printing photos; Presto! PageManager for converting text; Windows 3.1, Windows 95, Windows NT & Mac drivers; and a SCSI-2 adapter card and cable.

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Umax Astra 600S System with Adobe Photoshop 4.0	**$499**

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The S12 gets bigger and better

When *PC Magazine* set out to find the best general-purpose scanner, they considered brands from a dozen manufacturers but ended up choosing our best seller: the Umax SuperVista S12.

In their words: "Business and personal users need an easy-to-use device that will handle both document scanning and color scanning at an affordable price. For those users we recommend our Editors' Choice, the UMAX Vista-S12 ($500 street). The combination of value and performance delivered by the 24-bit, 600-dpi Vista was unparalleled in this roundup."

Now the S12 has been upgraded to the Astra 1200S, with the same great color quality *plus* a legal-size bed and a true 30-bit scanning process. These features make it an even better value at the same price! The Astra 1200S comes with the same great software bundles as the other Astra scanners, and includes Windows 3.1, Windows 95, Windows NT & Mac drivers; and a SCSI-2 adapter card and cable.

Umax Astra 1200S Complete Scanning System (Reg. $499)	**$438**
Umax Astra 1200S System with Adobe Photoshop 4.0	**$628**

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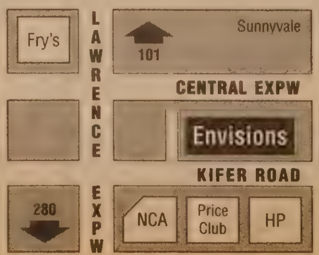

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Free classes	No	No	YES
Free user manual	No	No	YES
Mac software available	✓	No	YES
Down-loadable software	No	No	YES
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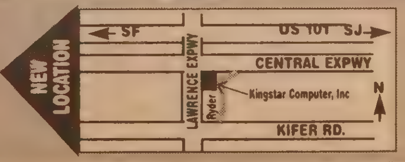

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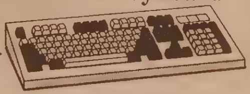

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He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991), led the successful 1993 citizen effort making state legislation and statutes available via the public Nets without state charge and served on the 1995 California Secretary of State's Electronic Filings Advisory Panel advocating online campaign finance disclosures and the 1996 state Senate's Task Force on Electronic Access to Public Records.

He founded InfoWorld, was founding host of PBS' *Computer Chronicles*, founding editor of *Dr. Dobb's Journal*, served half a decade on the Board of Directors of Autodesk, Inc., and has chaired various computer and mathematics organizations. Warren has received the John Dvorak Lifetime Achievement Award (1995), Hugh M. Hefner First Amendment Award (1994), James Madison Freedom-of-Information Award from the Society of Professional Journalists—Northern California (1994) and Electronic Frontier Foundation Pioneer Award in (1992, its first year).

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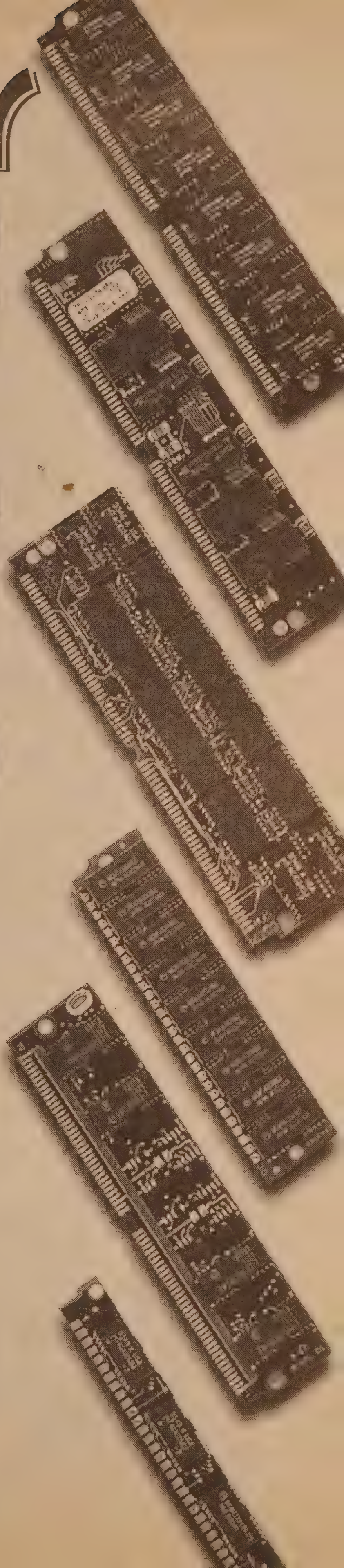

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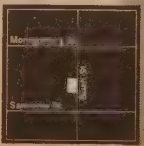

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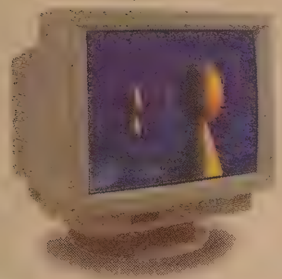

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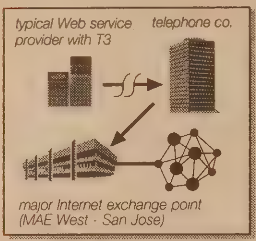
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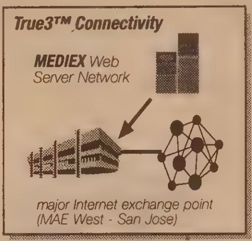
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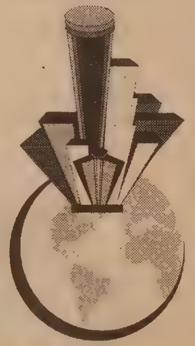

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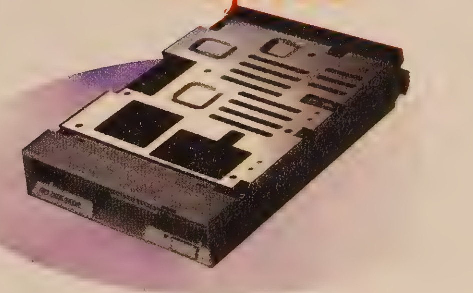

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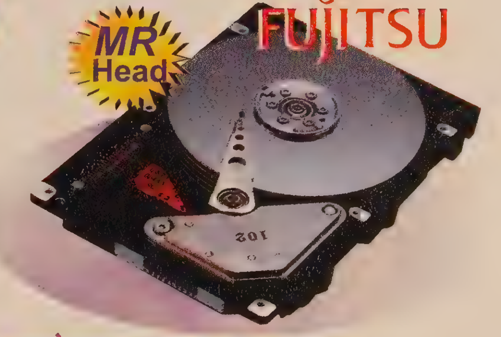

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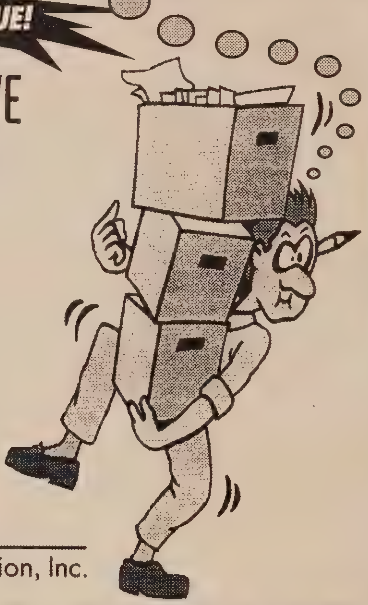

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News and Views

BY PAUL HOFFMAN

Industry Insights

Price Realities Come (Slowly) To The Internet

It's wonderful to be writing about the Internet so often these days. Fifteen years ago, when we wrote about "computers," we could be talking about mainframes, minicomputers (remember them?), or the new-fangled "personal computers" that were just starting to get noticed in the mainstream. The word "computer" was overly broad, and therefore let writers talk about almost anything. Today, the word "Internet" lets us do the same thing, since it is impossible to precisely define what the Internet is.

Because defining the Internet is so hard, it is also difficult to say whether a particular event that affects the Internet will "hurt" it or "save" it. This month's case in point: The trend, started by Internet backbone provider UUNET Technologies, to charge smaller Internet providers connecting fees. Some people saw this as the beginning of the end for the Internet, which would end up being less than universal; others saw this as the healthiest thing that could happen, making everyone more responsible for the amount of traffic they generate.

The issues here are fairly US-centric, because the US has much more competition in its Internet market than other countries. In fact, in many countries, in order to become an Internet Service Provider (ISP), you have to go through a heavy bureaucratic process with the government or the national telephone company; in return, that agency takes care of all the inter-ISP connections. However, as more and more countries start following the US model (for better or worse), they will confront the same large-scale Internet issues we are seeing today.

Who Is Your Peer?

The problem UUNet brought to a head is known as "peering fees."

The Internet is made up of thousands of segments, all privately owned. The points where two segments connect are controlled by routers. Many of the connection points connect segments from two different companies, and the routers must be able to determine the best way to move data from one company's lines to the other. Even when the Internet was basically a US government-owned system, routers performed the same tasks.

Until recently, the large companies that own the long-haul segments on the central part of the Internet let smaller companies set up routers to exchange data for free. The reasoning was that the customers of the large companies wanted access to the data of the small companies just as much as the customers of the small companies wanted their data to travel easily and quickly to the large company's network. This passing of packets (messages) at one point is called "peering" because, in the old days, everyone was essentially a peer of each other, and the large companies weren't all that much different from the small ones.

This whole arrangement may sound a bit odd because you would think that each network would have to peer with every other network. In the old days of the Internet, that was exactly what happened. However, as some players grew faster than others, the largest networks allowed smaller networks to pay them to move their data out over the Internet and, at the same time, do all the peering arrangements. This meant that peering was less complicated than it might be, and helped make the Internet more efficient at the same time.

> ***It is difficult to say whether a particular event that affects the Internet will "hurt" it or "save" it.***
> *This month's case in point:*
> *The trend, stared by Internet backbone provider UUNET Technologies, to charge smaller Internet providers connecting fees.*

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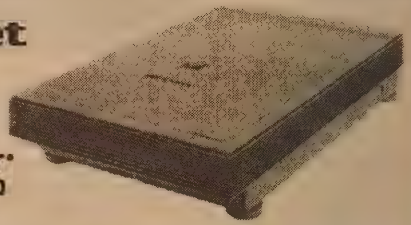

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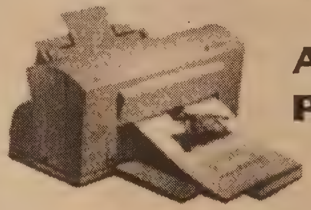

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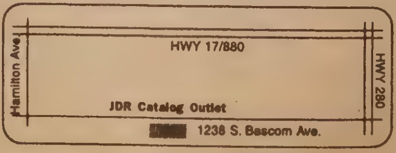

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Transit Costs

Peering is simply the exchange of packets, not an agreement to take them any further than the next hop on their journey. If you're on network A, and you want to get a packet to network C, you have two options: Directly peer with C, or have an agreement with some other network, B, to carry your packets from you to C. Having someone else carry your packets for you is called "transiting," and it is the business glue that holds the Internet together. Almost all transiting agreements in the US are "complete" arrangements, meaning that network B agrees to take all packets from network A, not just packets destined for a few particular networks, and deliver them.

Transit agreements also include service agreements. The network transiting your data also agrees to maintain the hardware needed for getting the data to you and from you. For many years, the service part of the agreements was pretty much taken for granted, but as the Internet has become more and more complex, it has become harder for the large backbone networks to provide the same level of service for the same price. For example, it is getting much harder for anyone to find technicians who understand how to configure and maintain today's routers: most of the people who could learn this kind of arcane knowledge already are working in the field.

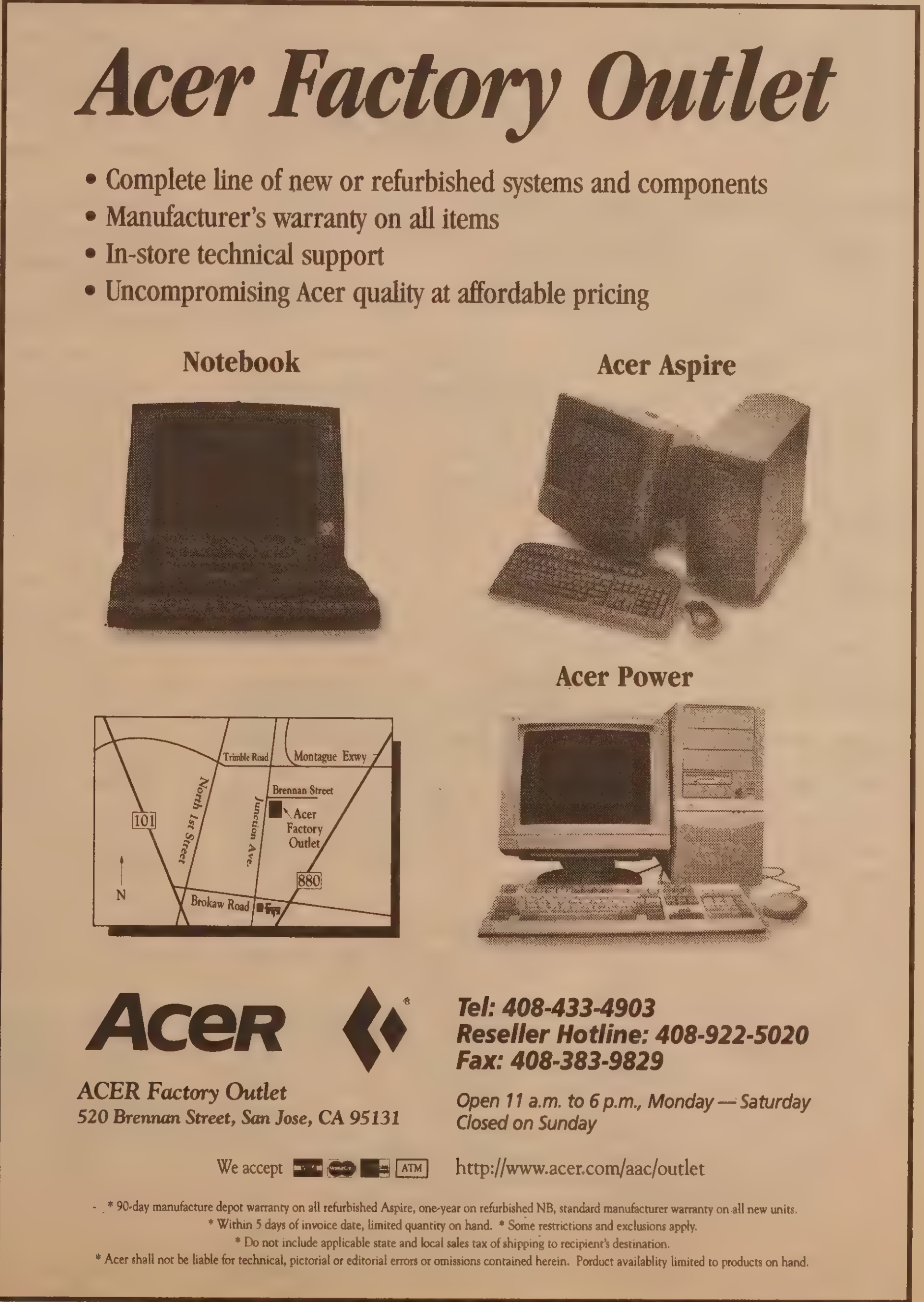
Peering Helps

Which brings us back to the problem that UUNET finally decided to address. Because the Internet is a mesh of interconnections, there are lots of ways to route packets, which unfortunately means that there are lots of ways to do it wrong. Proper peering helps makes the Internet more efficient because it helps move the packets from one place to another with the least number of "hops" between routers. If you think of the Internet as wires connected by routers, you'll see that it's not the wires that slow down a packet, it's going through too many routers.

UUNET and the other major backbone providers had allowed free peering, even to small networks, mostly because free peering had always just been the way that things happened. About two months ago, there were rumors that UUNET was not renewing its free peering agreements, and there was a great deal of fear that without free peering, the Internet would fall apart. The logic was that if small regional networks had to pay for peering with everyone else, the costs would be prohibitive.

After the rumors spread to the press, UUNET then made an announcement that the rumors were true, and other major backbone carriers also started to review their free peering arrangements. UUNET emphasized that it was still willing to make peering arrangements with small networks, just not free ones. UUNET also emphasized that it was still making free peering arrangements with large networks that UUNET considers its peers, namely those with national backbones and many interconnection points.

The concerns about the end of free peering are probably overblown, since peering is only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Industry Insights *continued...*

one way to connect—there's always transit agreements. In fact, although transit agreements are more expensive than what UUNET wants to charge for peering with small providers, transit agreements give small networks much more service. Because a transit agreement says that UUNET (or any other large network) will take all of the packets and do all of the routing for them, smaller networks actually have less service they have to provide their customers.

It is clear, however, that smaller networks will probably have to pay more in the future for their connection to the rest of the Internet. They will either have to pay multiple peering charges, or pay more for their transiting. These costs, of course, will have to be passed on to their users, who are often smaller ISPs and businesses. However, these costs should not be all that much, and may even result in better Internet connectivity for everyone as people start to pay for what they actually use.

The "S" in ISP Should Really Mean Service

Much of the problem with today's Internet is that people are unclear about what they are paying for. End users often think that they are paying for access to content, not for service. They go with ISPs who, in fact, don't give very good service, and therefore can charge very little. The major backbone providers found that the free peering was often not very useful because they were providing a lot of service to ISPs who were clueless about what they were doing.

> *The concerns about the end of free peering are probably overblown, since peering is only one way to connect: there's always transit agreements.*

ISPs who are more service-oriented discovered a few years ago that the best way to provide high-quality connectivity for their customers was to have more than one transit agreement with backbone providers. That way, when one provider was down or having technical problems, their packets still made it to the Internet, albeit usually much more slowly. Having more than one transit provider takes some advanced technical expertise, but it gives the users much better, and more reliable, service.

The Internet, then, is becoming more and more like the PC business. You can go to a computer dealer and buy a cheap computer without caring much about the parts inside of it or about how good the dealer's service is, and you might be fine. On the other hand, if the dealer sells computers with more reliable parts, which were probably more expensive than the lowest-end parts, you are less likely to need service from the dealer, and when you do, the dealer may be better able to determine the problem quickly.

Some people only want to buy from "the top of the ladder," and they can often do this by buying computers direct from the largest manufacturers and Internet service direct from the backbone providers. However, being a tiny customer from a top-tier provider may actually get you less service (and certainly cost more) than buying from a quality reseller. Small and medium-sized networks are discovering this as they have to refigure their costs of connecting to the core Internet and determine how they will spread those costs to their customers. ■

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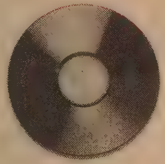

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Industry Insights *continued...*

MICROTIMES INDEX CLIMBS TO A NEW HIGH

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 05/08/97	CLOSING PRICE 06/05/97	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL IVIDEN RATE	ANNUAL IVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
NAS	Adobe	(H)	ADBE	44.00	42.44	-1.56	-3.55	19	0.20	0.47	49.00	28 50
NAS	Autodesk		ADSK	38.50	36.25	-2.25	-5.84	-	0.24	0.66	40 88	18.50
NAS	Borland		BORL	6.75	7.13	0.38	5.56	-	0.00	0 00	13 25	4 75
NAS	Broderbund		BROD	21.50	27.63	6.13	28.49	77	0.00	0.00	44 00	17 75
NAS	Informix		IFMX	8.25	9.88	1.63	19.70	-	0.00	0.00	31.13	6 56
NAS	Macromedia		MACR	7.50	9.50	2.00	26.67	-	0.00	0.00	45 75	6 50
NAS	Microsoft	(H)	MSFT	116.50	120.38	3.88	3 33	53	0.00	0.00	129.06	53.75
NAS	Novell		NOVL	8.50	7.63	-0.88	-10.29	18	0.00	0.00	14.63	7.00
NAS	Oracle		ORCL	43.88	47.50	3 63	8.26	44	0.00	0.00	51 00	32 00
NAS	Symantec	(H)	SYMC	16.88	19.25	2 38	14.07	41	0.00	0.00	20.00	8 75
	HARDWARE											
NAS	Apple		AAPL	17 00	16 69	-0 31	-1 84	-	0 00	0.00	27.75	15.13
NYS	Compaq	(H)	CPQ	93 25	99 38	6 13	6 57	19	0 00	0.00	110 38	40 50
NYS	Digital Equipment		DEC	30 75	35 13	4 38	14 23	-	0.00	0.00	51 38	25 00
NAS	Dell	(H)	DELL	92.75	108.44	15.69	16.91	32	0 00	0.00	115.75	20 25
NYS	Gateway 2000	(H)	GTW	62 75	62 13	-0.63	-1 00	18	0 00	0 00	75 38	27 75
NYS	Hewlett-Packard		HWP	52 88	50.88	-2.00	-3.78	19	0 56	1 10	60 00	37.75
NYS	IBM	(H)	IBM	83 69	82 88	-0 81	-0.97	15	0.80	0.97	91.88	44 63
NYS	Silicon Graphics		SGI	15 50	17.25	1 75	11.29	-	0.00	0 00	28.38	12 63
NAS	Sun Microsystems		SUNW	31 38	33 69	2.31	7 37	20	0 00	0 00	35.13	22 00
NYS	Xerox	(H)	XRX	63 63	66 63	3 00	4.72	19	1 28	1.92	68.50	44 63
NYS	Tandy		TAN	52 25	53 50	1 25	2.39	-	0 80	1.50	55.50	37.13
	CPU'S											
NYS	Advanced Micro Devices		AMD	44 75	37.50	-7 25	-16 20	-	0 00	0.00	48 50	10 25
NYS	Cypress Semiconductor		CY	15 13	13 38	-1 75	-11 57	48	0 00	0 00	16 63	9 13
NAS	Cyrix		CYRX	22 00	24 13	2 13	9 66	-	0 00	0 00	33.00	11 50
NAS	Intel	(H)	INTC	158 75	143 13	-15 63	-9 84	20	0 24	0 17	169 75	64 13
NYS	LSI Logic	(H)	LSI	42 25	38 75	-3 50	-8 28	36	0 00	0 00	46 88	17 00
NYS	Motorola		MOT	60 25	65 63	5 38	8 92	36	0.48	0 73	69 75	44 13
	COMMUNICATIONS											
NAS	3Com		COMS	38 38	44 19	5 81	15.15	26	0 00	0 00	81 38	24 00
NYS	AT&T		T	32.50	35.50	3.00	9.23	10	1 32	3 72	43 25	30 75
NYS	BellSouth Corp.		BLS	44.50	43.63	-0.88	-1.97	17	1 44	3.30	47 63	35 25
NAS	Cisco		CSCO	61.38	64.75	3.38	5.50	38	0.00	0.00	75 75	44.75
NAS	MCI		MCIC	37.88	39.00	1.13	2.97	23	0.05	0.13	39.63	22.38
NYS	Northern Telecom	(H)	NT	76.75	87.50	10.75	14.01	35	0.60	0.69	87.63	45.00
	INTERNET											
NAS	Earth Link		ELNK	12.38	12.25	-0.13	-1.01	-	0.00	0.00	22.50	8.63
NAS	Netcom		NETC	13 50	15.25	1.75	12 96	-	0.00	0.00	35.75	7 88
NAS	Netscape		NSCP	30.88	32 50	1 63	5.26	112	0.00	0.00	68.50	23.50
NAS	Yahoo		YHOO	34 13	32.44	-1.69	-4 95	-	0.00	0.00	37.38	15 50
	MEDIA											
NYS	Disney	(H)	DIS	81.25	80.75	-0.50	-0.62	30	0.53	0.66	85.13	53.25
NAS	TCI		TCOMA	14.50	14.44	-0.06	-0.43	-	0.00	0.00	18.88	10 75

KEY: NYS = NEW YORK ASE = AMERICAN NAS = NASDAQ
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES........................	23
DECLINES........................	16
UNCHANGED..	0
NEW HIGHS..	12
NEW LOWS.	0

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER........................	Dell	$	15.69
LARGEST DOLLAR LOSER........................	Intel	$	-15.63
LARGEST PERCENTAGE GAINER................	Broderbund		28.49 %
LARGEST PERCENTAGE LOSER......	Advanced Micro Devices		-16.20 %

	CLOSE 05/08/97	CLOSE 06/05/97	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	9110.24	9223.00	112.76	1.24
DOW JONES INDUSTRIAL AVERAGE	7136.62	7305.29	168.67	2.36
STANDARD & POOR'S 500 INDEX	820 26	843.43	23 17	2 82
N.Y.S.E. COMPOSITE	426.90	441.64	14.74	3.45
NASDAQ COMPOSITE	1330.83	1390.05	59.22	4.45

CLOSING QUOTES FOR GRAPH

DATE	MICRO TIMES	DOW JONES
10/21/96	7316.15	6090.87
12/12/96	8341.27	6303.71
01/20/97	8729.83	6843.87
02/13/97	8809.79	7022.44
03/13/97	8310.08	6878.89
04/10/97	8083 85	6540 05
05/08/97	9110.24	7136.62
06/05/97	9223.00	7305.29

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This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantees can be made. Nordby International assumes no liability for any inaccuracies. For information on Nordby's customized financial research services, call 1-303-938-1877.

Investors bumped up stocks last month, after learning that the Federal Reserve was not planning on increasing interest rates. The MicroTimes Stock Index followed the national indices into higher territory, rising 112.76 points, or 1.24%, to an all-time high of 9223.00. Advancers outmatched decliners by a 23 to 16 count, while companies achieving new highs towered over those reaching new lows by 12 to 0.

Similarly, the Dow Jones Industrial Average continued its northbound climb, increasing 168.67 points, or 2.36%, to a close of 7305.29.

Turning To Companies In The Spotlight

Xerox helped push our index to higher ground in last months' trading. Standard & Poor's affirmed its rating on the company, after Xerox announced its agreement to acquire the remaining minority interest in Rank Xerox from the Rank Group for 940 million British pounds (approximately $1.5 billion). Xerox shares were up $3.00, or 4.72%, to a close of $53.50.

Netcom's stock price climbed last month, amid speculation of a merger. Intermedial Communications said it would buy Digex, Inc., which fueled the fire of speculation about more industry consolidation. Consequently, shares of Netcom rose $1.75, or, 12.96%, to close at $15.25.

Intel did not fair as well in last month's trading. Demand in Europe unexpectedly weakened, without showing signs that competitors were gaining market share there. A spokesman for the company, Heiner Genzken, said the company doesn't know why demand softened. In response, Intel slid $15.63, or 9.84%, to end the period at $143.13.

Shares of AT&T rallied last month, after chairman Robert Allen announced at the annual meeting that boosting the company's stock price is his top priority. In response, the stock rose $3.00, or 9.23%, to a close of $35.50. It was an encouraging start to bringing the value of the stock back up to the $45 per share that it closed at a year ago. ■

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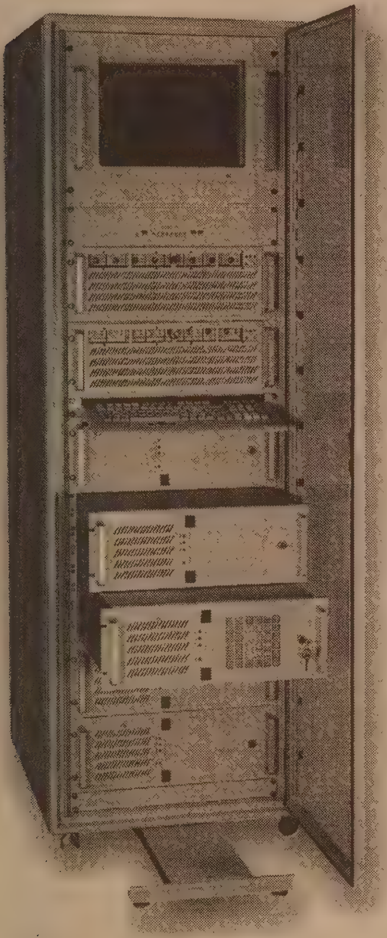

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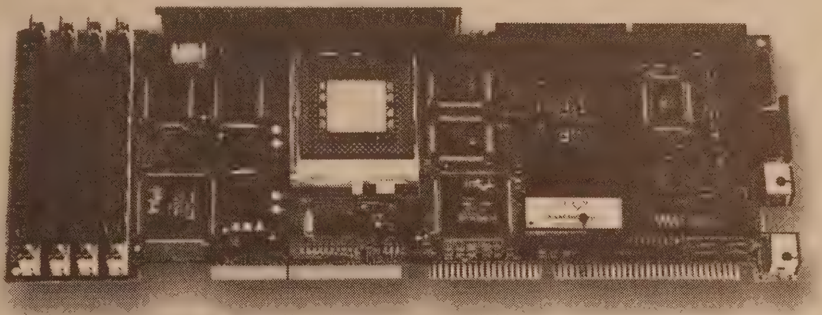

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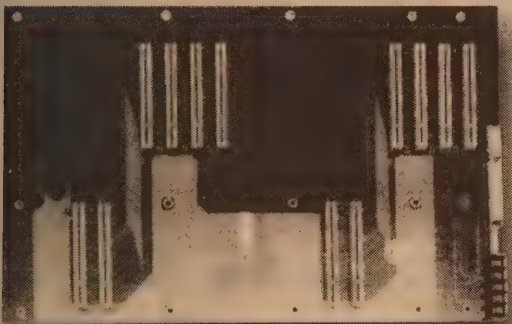

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It's us against them, and we're losin'—big-time!

"Us": the average citizen-victims of California, and the businesses that aren't big enough to buy special treatment. Businesses…those evil, job-producing, tax-paying operations that try to produce products and services if they have any spare time after fulfilling endless regulations and demands in this anti-business state. (If you don't believe it's a nightmare, just try risking your life's savings to open a business with offices, equipment and employees in this state.)

"Them": the Forces of Darkness. The bucks-hustling bureaucrats who can never find enough money to spend; the pugnacious public-employee unions who say to hell with the public's interests; the posterior-protecting politicians who fear that citizens might actually find out what they're doing; and the wealthy special interests who buy their votes.

At issue this month is the unending battle for modern (electronic) and equal public access to modern (computerized) public records: public information that local and state agencies create or collect from us at the point of a gun (under force of law), computerize for their internal convenience and cost-savings, and maintain to better and more efficiently perform the parts of their mission and goals that they choose to perform—all at significant taxpayer expense.

The Law Ignored

Local and state agencies are required by law to provide public access to their tax-prepaid public records for public review, and to provide copies of those public records to any requester for no more than "the direct cost of duplication."

Although the California Public Records Act (CPRA) has required this for decades, few agencies consider it anything more than an inconvenient nuisance, and most bureaucrats or politicians appear to consider it an insignificant element of their mission and goals—except, of course, for the information that they want to publicize.

> Without timely access to adequate information, the rights to vote, speak, publish and petition for redress of grievances are an empty pretense of freedom and democracy; façade without substance.

But the first sentence of the CPRA states, "the Legislature, mindful of the right of individuals to privacy, finds and declares that **access to information concerning the conduct of the people's business is a fundamental and necessary right of every person in this state.**" [§6250, boldface added]

Without timely access to adequate information on which to base sound decisions about the process of our own governance, the rights to vote, speak, publish and petition for redress of grievances are an empty pretense of freedom and democracy; façade without substance.

Half A Decade And Still Waiting

In October of 1992—as an public-records electronic-access "expert"—I attended a meeting in Scrappymento that began an effort to build consensus (Hah!—fat chance!) on modernizing the badly-outdated CPRA. The meeting had a broad spectrum of groups represented, although it was convened by two of the state's leading open-government advocates—Tom Newton, legal counsel and lobbyist for the California Newspaper Publishers' Association (CNPA) and Terry Francke, director and lobbyist for the tiny-but-potent California First Amendment Coalition (CFAC). Ted Prim, a career attorney and public records expert from the California Attorney General's office was there—and has proven to be a formidable defender of bureaucracies, against modernizing free or copying-cost public access to public records (details below).

Teachers' union representatives were there, zealously seeking expanded access to school budget details—especially details of any funds they could pursue in their closed-shop collective bargaining efforts. However, the teacher reps were equally zealous about continuing to prohibit any public access to teacher evaluations or disciplinary hearings against teachers, much less citizen or press access to complaints filed by students or parents against teachers. Gotta protect employee privacy, ya know—-and to hell with the public's interest in overseeing teachers' quality and performance. After all, it "only" concerns the future of our society.

Realizable Fantasies *continued...*

(Note: 80% to 90% of educational tax funds—which compose about 50% of the state's total expenses—are paid for salaries and benefits. These massive allocations of public funds are decided almost entirely in secret labor negotiations, with only the final result rubber-stamped in a public meeting.)

There was a meeting several years later, convened for the same purpose under legislative auspices. It began with a belligerent tirade by the union rep for the California Correctional Peace Officers Association against public access to prison disciplinary information. When he finished, he stormed out, snarling a final threat, "I've got just one thing to add—CCPOA!"

The CCPOA is one of the largest political donors in the state, and known as one of the most powerful—in the event that you were wondering why our tax-paid prison guards are among the highest-paid law officers in the nation.

Like all other meetings about modernizing the CPRA, this meeting died a quick death.

Campaign Finances Still Hidden In Plain Sight

Through 1995, I served on Secretary of State Bill Jones' Electronic Filings Advisory Panel, which produced recommendations for how to electronically file and provide timely online public access to campaign finance disclosures—currently "available" only in mountains of misfiled paper in far-distant government offices.

To date, the Panel recommendations have gone nowhere—repeatedly sunk by coy Demopublicans and Republicrats alike. Gotta protect the privacy of those shy vote-buyers, ya know.

That endless fight is continuing. Get latest details from Kim Alexander *kimalex@netcom.com* , executive director and janitor of the California Voter Foundation (*http://www.calvoter.org*).

The Latest Farce

Through much of the last year, I've wasted time running up to Sacramento as a member [pro bono, as always] of the California State Senate Task Force on Electronic Access to Public Records, created in 1996 by State Senator Quentin Kopp (Ind.-San Francisco). Same issue; same result, so far.

Originally, I had hopes for this Task Force; Kopp used to support robust, public access to our government. But many of us are wondering if he's sold out the principle of modern public access—or has just lost control of his staff. Kopp never attends meetings of his own task force; it's run by his junior aide, Teri Burns.

Although it's unclear who is and is not a member of the task force—people wander in and out from one meeting to the next—as far as I can tell, I'm the only citizen member, although a librarianship grad student sometimes attends. That is, I'm the only one who is not a paid lobbyist, information peddler, or tax-paid bureaucrat (lobbying for their self-interests, which may or may not match the public's interests).

Two years ago, Senate Bill I required that Flynn's Department of Information Technology develop a plan by January 1, 1997, for how agencies would provide public access to their already-computerized public records. Six months overdue, Flynn has provided zippo!

Much worse: I'm one of the few members advocating free or copying-cost-only access to our public records. Most of Kopp's appointees represent self-serving local and state agencies overseen by self-serving politicians.

I snarl that they are "self-serving" because—almost without exception—they are either tenaciously trying to reduce the scope of public access that has been required for decades, or ardently advocate peddling our tax-prepaid public records back to us—if the copies are in a useful, computerized form—at profiteering rates far in excess of the traditional "direct cost of duplication."

Backed by the Attorney General's Ted Prim, they say paper copies fulfill the copy requirement of the CPRA—that online access or digital copies of already-computerized public records are "enhanced" records and "enhanced" access!

I refuse to have my name any longer associated with this loaded task force and its latest recommendation (as of my June 2nd press deadline), below, so—by copy of this column—I quit!

Modern Access For Those Who Can Buy It

The bureaucrats who dominate the task force provided a majority rubber-stamp for the following recommendations (the first two are great; the last one sucks!):

1. Amend Kopp's Senate Bill 74 to delete from the CPRA the major anti-access loophole that says, "Computer data shall be provided in a form to be determined by the agency."

[Good riddance! Bureaucrats have used this for decades, to refuse to provide computer copies of computerized public records!]

2. Add a mandate that, "Agencies shall provide a copy of an electronic record in the format requested, unless, in light of surrounding circumstances, it is not reasonable to do so, provided that the requested format is one which has been used by the agency to create copies for its own use or for provision to other agencies."

[In spite of the dangerously weasely language, we've pleaded that this be required for years!]

3. But they also recommended adding the following, demolishing decades of the CPRA's crucial tradition of limiting "copying" fees to "direct cost of duplication":

"Electronic copies of records shall be made promptly available upon payment of fees as follows:

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["Commercial" ISPs, BBSes, CD-ROM

continued on page 37

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- Matrox Mystique w/4MB SGRAM
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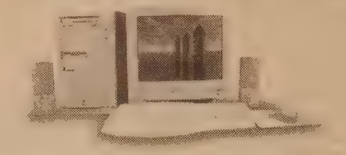
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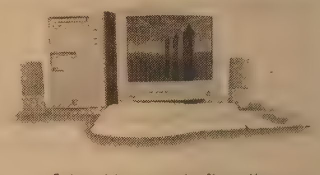
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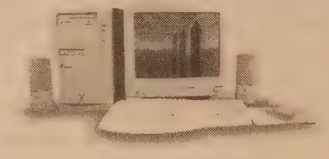
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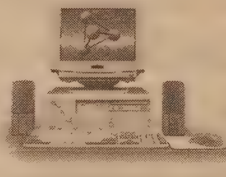
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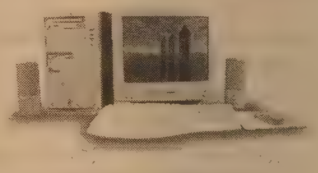
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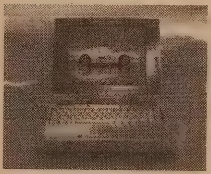

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Realizable Fantasies *continued from page 33*

publishers, feature magazines, wee-fee public-nterest attorneys, and so on, are excluded! I pecifically pleaded to at least explicitly include ibraries, academic institutions, nonprofit organizations and freelance researchers, and Ted Prim explicitly stonewalled it.]

“Commercial purpose does not include any request made by a person who, through contract or employment, is a publisher, editor or reporter vith a news gathering organization and makes he request in that capacity.”

[Approved by the CNPA's board, this is a major reversal of California newspapers' long-tanding public-records position. Until now, hey have always demanded equal access for all; hat the press not be made a privileged class.]

“(2) For requests in which the information is to be used for any commercial purpose, the records hall be made available upon payment of the actual cost of providing the record, which shall include he costs of search, retrieval, review, segregation, and duplication, plus a x percent surcharge, or a statutory fee. All funds collected by an agency from the x percent surcharge shall be used by the agency exclusively for the purposes described in section 6253 [that is, for anything in any way related to public-records access—copy machine rentals, buying paper and probably even depreciation on the building that houses the records].”

This bureaucrats' task force also proposed a Statement-of-Legislative-Intent to clarify “reasonable” circumstances for disclosure, stating:

“In interpreting whether disclosure of a copy of a record in an electronic format is reasonable under surrounding circumstances, we are mindful of the dictionary definitions of the term “reasonable.” These definitions consistently indicate that the term reasonable means moderate, inexpensive, fair, suitable under the circumstances, and not excessive. Thus, if disclosure of a copy of a record in electronic form is consistent with these concepts, the agency would be expected to make disclosure in that form.

“Some examples of circumstances in which it would not be reasonable to require compliance with the general rule would include the following situations:

- *Significant reprogramming or the creation of new software would be necessary to fulfill the request; and*
- *The task of redacting [deleting] or segregating exempt [non-public data] from disclosable*

> I'm one of the few members of Quentin Kopp's task force advocating free or copying-cost-only access to our public records. Most of Kopp's appointees represent self-serving local and state agencies overseen by self-serving politicians.

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Realizable Fantasies *continued...*

material would be unduly burdensome."

[This creates a monumental loophole, worse than the one they use in the current law. Namely, agencies can dodge public-access requirements simply by intimately co-mingling public information with non-disclosable information in a single database. This is already common in agency databases designed without thinking that public access was one of their responsibilities.]

Has Kopp Sold Us Out?

Aside from the pro-profiteering, pro-bureaucracy bias of Kopp's task force, there's also the issue of Governor Wilson's Information Technology czar, CIO John Flynn. Before his appointment was ever confirmed by the Senate, he publicly testified (February 7, 1996) that public records were too valuable to not consider selling them at market rates. (For instance, the Department of Motor Vehicles sells our personal data for more than $45 million per year. That *is* why you gave the DMV your personal information…isn't it?)

But after Flynn publicly advocated peddling our public records for profits (they call it "revenue"), not only did Kopp vote in favor of his confirmation, he sponsored this data-peddler!

> The Department of Motor Vehicles sells our personal data for more than $45 million per year. That *is* why you gave the DMV your personal information…isn't it?

State's CIO Ignores Senate And The Law

Two years ago, Senate Bill 1 required that Flynn's Department of Information Technology develop a plan by January 1, 1997, for how agencies would provide public access to their already-computerized public records. Six months overdue, Flynn has provided zippo (as of June 1)!

Kopp chairs the Senate's Select Committee on Information Services in State Government, which should be overseeing this. But our formerly diligent watchdog hasn't raised even a wee-tiny whimper about Flynn's disregard for state law and public access.

Please, Quentin, Show Us It Ain't So

By action, show that you still support free and copying-cost-only public access to public records, even in their modern, useful, valuable, already-computerized form.

Please show us, by action, that you haven't sold us out to buck-hustling bureaucrats and data profiteers—and limited modern government access to those who can buy it. ■

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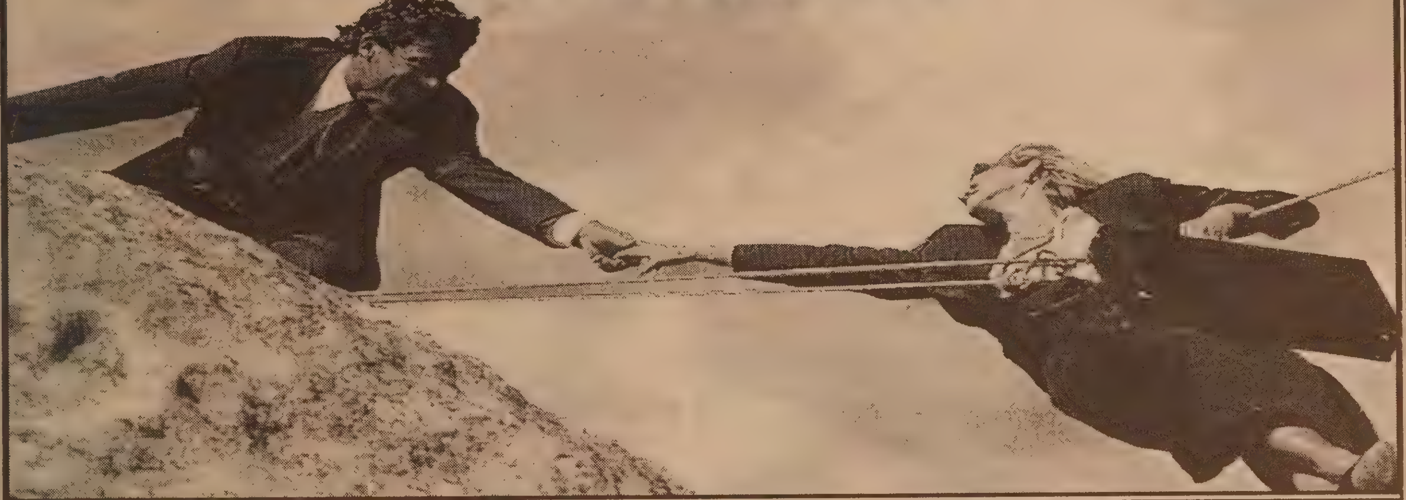

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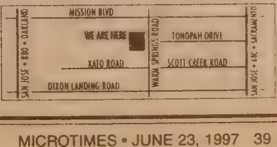

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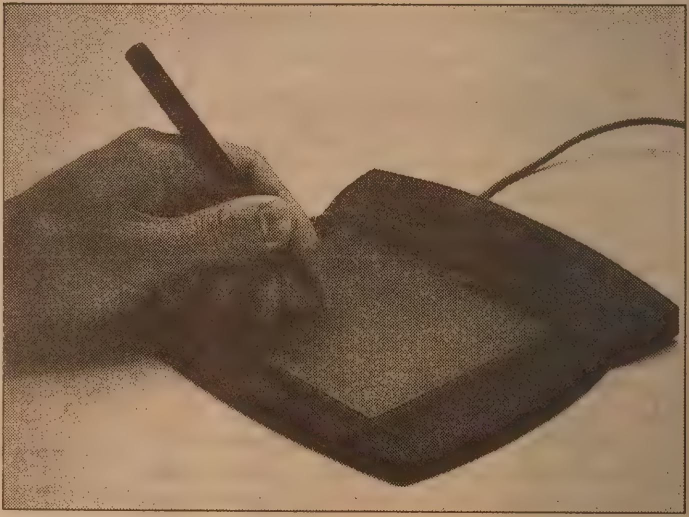

Despite all of the advances in computing, many people still long for the convenience of pen and paper. Typing on a keyboard requires a skill that is an obstacle for many people who feel that they cannot think with the distance a keyboard puts between the brain and the output. Nevertheless, keyboards remain the dominant input device for most laptop users.

Communications Intelligence Corp. hopes to move us closer to the earlier days of pen and paper with Handwriter Manta. The Handwriter consists of a small tablet that weighs about 10 oz., an electronic pen-like device, sophisticated software, and a cable that connects the tablet to the computer through a serial port.

The electronic pen resembles a conventional pen or pencil, but is powered by a couple of tiny batteries that will last for hundreds of hours. Writing on the pad transfers your marks to the computer screen. The pen can also work like a mouse. You move the pen to wherever you like on the screen. This is just like moving the mouse pointer. If you tap the pad with the pen point, it is like clicking the left mouse button. A button on the pen serves in place of the right mouse button. For people who are uncomfortable using a mouse, this is a good alternative.

The package includes a good tutorial and a crossword puzzle program to help you become comfortable with writing on the tablet. While we all know how to write on a tablet of paper, writing in a way that a computer can understand requires a new set of skills. The Handwriter documentation suggests that the learning curve is easy. They say that a half-hour investment will make you comfortable using the Handwriter Manta. My own experience was that it took longer to become comfortable with the device.

Computers, with all of their power, have a hard time deciphering handwriting. First, they cannot handle cursive writing; they simply cannot tell when one letter ends and another begins. Secondly, even if you print the letters and numbers, the computer has a hard time distinguishing between certain letters and numbers. As a result, the Manta has to teach you how to make the letters so the computer can recognize them.

There are several ways of learning this new system. The tutorial offers a number of exercises that will teach you how to make the letters the software will recognize. A second way of becoming facile with the device is to answer a series of questions that are designed to teach the software how to recognize the way you make your letters and numbers. In either case, you and the software must learn to communicate before you can write efficiently on the pad.

The crossword puzzle package that comes with the Handwriter Manta helps you become familiar with entering text through the writing pad, which measures about 7" x 8" with a writing surface of a little larger than 4" x 5." Once you become comfortable with the Manta system, you can begin to work in other programs. With Microsoft Word, you can install an icon on your toolbar that lets you edit and revise Word documents with Handwriter. You can do the same with a number of other programs. In

continued on page 44

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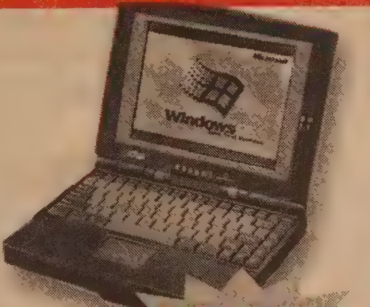

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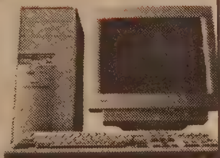

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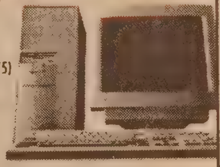

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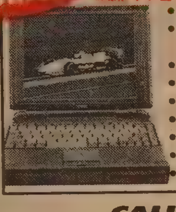

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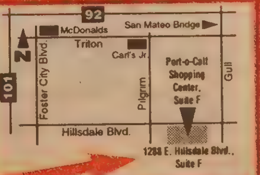

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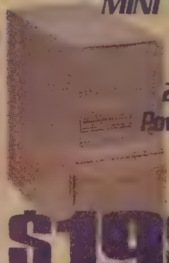

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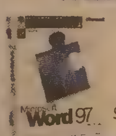

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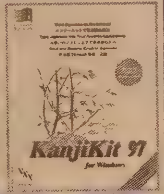

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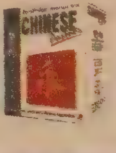

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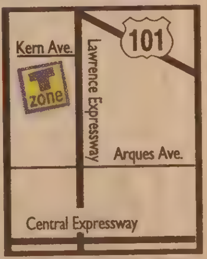

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Laptops

continued from page 40

spreadsheet programs, for instance, you can enter numbers directly into the cells with the electronic pen.

There are other things you can do with this device, like add your signature to letters, but for the most part, I found that the benefits of Handwriter Manta were outweighed by the awkwardness of carrying around another piece of equipment. The advertising suggests that it is easier to work on the tablet than on a keyboard when you are on an airplane. I found from personal experience that it is virtually impossible to use this device on a plane unless you are in first class. There is simply not enough room to set up your computer and put the Manta anywhere except inside your shirt.

As I worked with the Handwriter, I kept reminding myself that because I actually like keyboards I should be careful to not be too harsh on this system. In the end I had to admit that there is a real need for Handwriter Manta for people who have wrist problems. If you suffer from tendonitis or other repetitive stress injuries, this product could be a real godsend.

I see this as a specialized product that fills a need and does it well, but I do not see this as something that belongs on every desk. Keyboards are simply too efficient to be supplemented by this pad unless you have special needs.

The Handwriter Manta works with either Windows 3.1 or Windows 95. With Windows 95 it requires at least 20MB of hard drive space and at least 8MB of RAM. The software comes on three floppy disks, alleviating the need for a CD-ROM drive just to get the system up and running. The product comes with a one year warranty.

> ***There is a real need for Handwriter Manta for people who have wrist problems. If you suffer from tendonitis or other repetitive stress injuries, this product could be a real godsend.***

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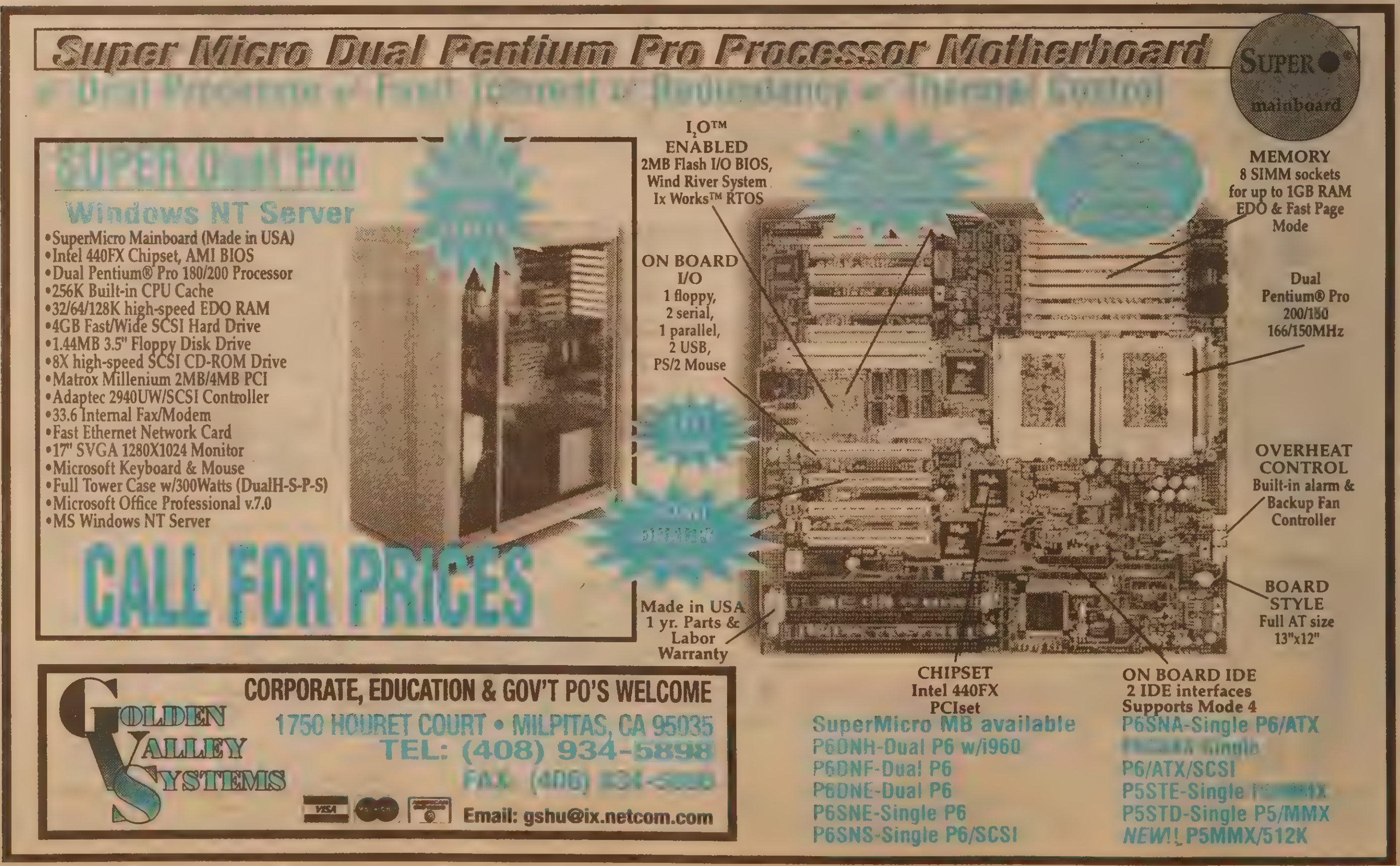

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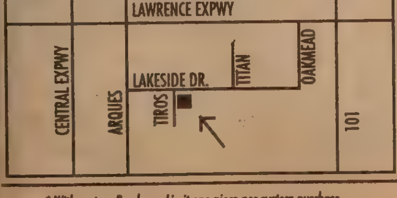

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Computer Of The Month

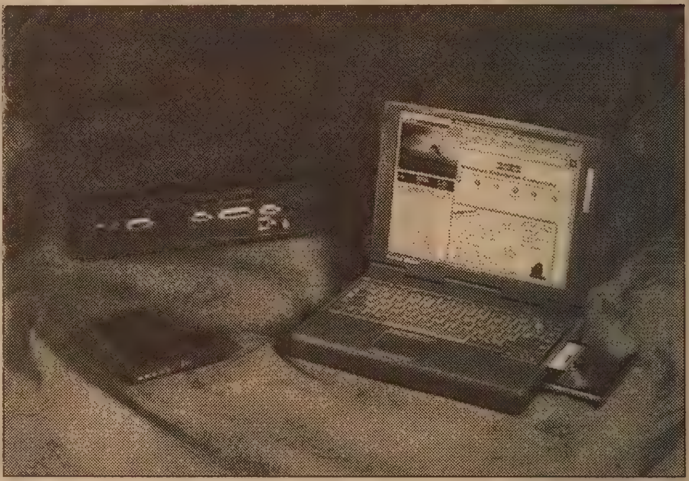
Digital Equipment's HiNote VP 500

Digital Equipment Corp., once one of the top companies in the computer world, was slow to enter the laptop field. Earlier, after introducing several spectacular models, they decided to exit the market. Now they are back with another winner with one of the most powerful notebooks available today.

The HiNote 500 series is available in three configurations with prices ranging from $2,499 up to $4,499 for the top-of-the-line model 575. All three models come standard with 16MB of RAM, expandable up to 80MB, and have a 12.1" display. The HiNote VP 575 is powered by a Pentium 166MHz chip with MMX technology.

Digital incorporated innovative design features into the HiNote series. For example, the expansion bay on the side of the computer has a drive module that includes both 1.44MB floppy and 12X CD-ROM drives. Most of the competing notebooks require you to choose between these two drives. Digital's approach lets you always have both drives available. In these days of software increasingly coming on CD-ROMs, it is an added convenience to have both drives available all the time.

The module that holds the drives is easily replaced with a second battery pack ($279). With improved circuitry and battery technology, by using two batteries it is possible to power a notebook for up to ten hours. In the most expensive HiNote notebook, Digital uses a Lithium Ion battery rather than the Nickel Metal Hydride battery found in the lower-end models. Lithium Ion technology provides more power for the weight and does not suffer from memory effect. Memory effect reduces the duration of a battery's charge if you consistently recharge when the battery is not fully depleted. In other words, if you run the battery for an hour and then recharge, over time the battery will remember that it only has to run for an hour. While the condition can be reversed, it is an annoyance.



Hard drive configurations range from a 1.44GB all the way up to a huge 2.16GB drive. Like much of the rest of this computer, these drives are removable and can be replaced if they fail or with larger drives if needed.

Digital has made it easy to attach an external monitor and gives you the option of viewing the built-in display, the external monitor, or both. Since many people attach an assortment of peripherals to their notebook at their primary work location, Digital designed the HiNote so that everything will continue running even after you close the top. But in normal mode, with the top closed, the computer goes into a suspend mode, letting you stop in the middle of an application and return to where you left off simply by opening the top.

The keyboard is well-designed and easy to use. There is a TouchPad in lieu of a mouse; if you prefer a mouse, you will need to connect it through the serial port. There is a PS/2 port that could be used by the mouse, but you will probably want to reserve that for an external keyboard.

The HiNote has two PC Card slots that let

> *The HiNote 500 series is available in three configurations with prices ranging from $2,499 up to $4,499 for the top-of-the-line model 575.*

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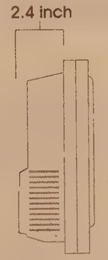

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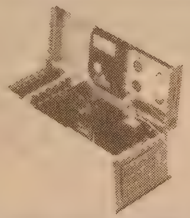
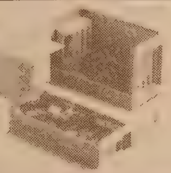


- 6-slot ISA/PCI backplane
- Supports two drives
- Cooling fan with air filter
- 150W Power Supply

MBPC-641 MicroBox PC



- 4-slot ISA-bus backplane
- Ultra compact for embedded control
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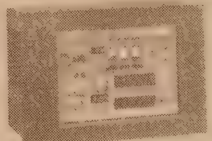
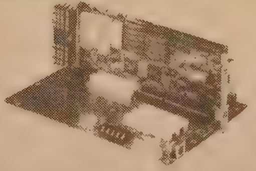
MiPC-51 Workstation w/TFT LCD Display



- 4-slot ISA bus backplane
- Supports two 3.5" drives
- 640x480 TFT Color LCD
- 65W Power Supply

CPU cards



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Laptops *continued...*

you use either a single Type III card or up to two Type I or II cards. Once again, Digital has used the newest and most powerful technology for these slots. They utilize the new CardBus standard that lets information flow much more rapidly than the older standard. In addition, the slots are set up for Zoomed video, which lets you see full motion video if you use a Zoomed video card.

As with most new notebooks, high-speed infrared transfer of files is accommodated through the serial infrared sender and receiver on the back of the computer. Most new notebooks have only one serial port, but with the PC Card slots and the infrared reader, there is no need for more.

The computer is rounded out with full multimedia support. Speakers are located above the keyboard for either monaural or stereo sound. In addition, there are ports on the side for microphone, line-in and line-out. The system is Sound Blaster-compatible.

The HiNote comes standard with Windows 95, but for an extra $200 you can upgrade to Windows NT 4.0. There is a full instruction manual available on the hard drive as well as in print. I was not able to navigate through the electronic users guide with the included Adobe Acrobat reader. Digital offers a one-year warranty. The HiNote series of notebook computers is definitely worth a look when you are ready to buy your next computer. ■

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With improved circuitry and battery technology, by using two batteries it is possible to power a notebook for up to ten hours.

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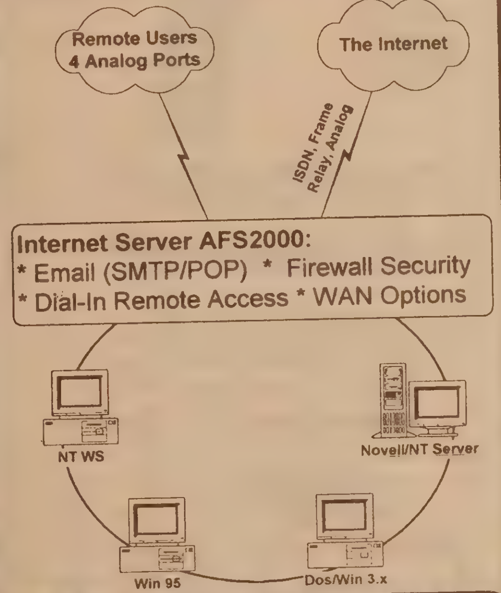

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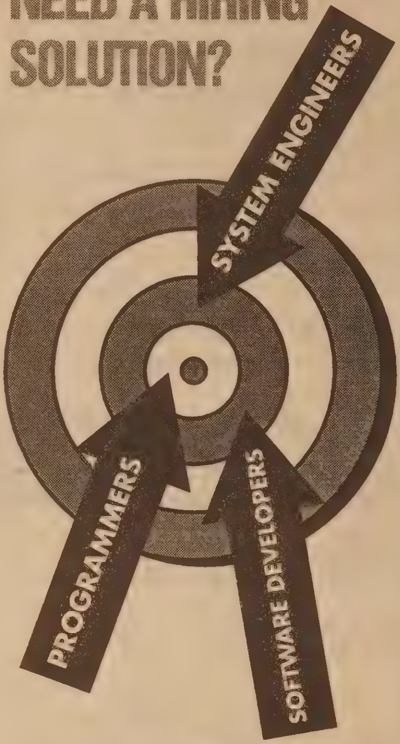

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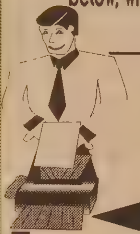

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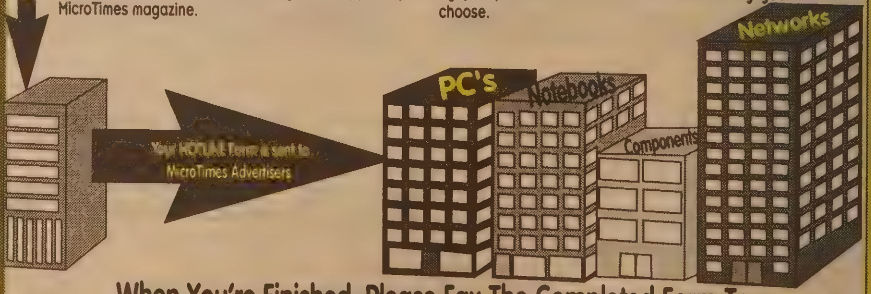
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○ PC NOTEBOOK ○ Network FILESERVER
○ MACINTOSH NOTEBOOK

PICK YOUR PREFERENCES
○ Name Brand
○ Compatibles
○ No Preference

Step 1: Enter PC System Brand Name & Model #. If Preference

Step 1: Enter NoteBook Brand Name & Model #. If Preference

Quantity / Choices
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○ MACPOWER PC ○ MAC QUADRA/PERFORMA

CPU MHz & SPEED:
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○ 200 ○ 180 ○ 166 ○ 150 ○ 133 ○ 120 ○ 100 ○ 80 ○ 75 ○ 66

BUS TYPE ○ PCI ○ VLB ○ EISA ○ ISA

CACHE ○ 64K ○ 128K ○ 256K ○ 512K

RAM: ○ EDO ○ 2MB ○ 4MB ○ 8MB ○ 16MB ○ 32MB ○ 64MB ○ 128MB

HARD DISK DRIVE: ○ 100MB+ ○ 800MB+ ○ 1GB+ ○ 2.5GB+ ○ 4GB+
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FAX MODEM: ○ Internal ○ External ○ 33600bps ○ 14400bps ○ 28800bps

CASE TYPE: ○ Mid Tower ○ Desktop ○ Full Tower

VIDEO CARD RAM ○ 512KB ○ 1MB ○ 2MB ○ 3MB ○ 4MB

POINTING INPUT DEVICES: ○ Any Mouse ○ MS Mouse ○ Keyboard
○ Serial ○ Bus ○ PS2 ○ Trackball ○ Joystick ○ Ball Point ○ Pen

OPERATING SYSTEM NEEDED: ○ Windows 95 ○ OS2/Warp
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○ 8X
○ 10X
○ 12X
○ 16x

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CD ROM Brand Name and Model Number

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○ 32Bit

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○ 25 to 50W
○ 50 to 75W
○ More Than 75W

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○ Users 2 to 10 ○ Users 10 to 50 ○ Users Over 50 ○ Lantastic ○ Apple Talk ○ Novell ○ MS NT

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Online At 56Kbps

The New Modem Technology

Whether you are a Net surfer looking for a faster way to get online, or a LAN manager looking to provide users with dial-up access, the new "56K" modem technologies have probably caught your eye. Promising a higher speed over standard analog phone lines, they sound like an attractive alternative to ISDN. The question is, do they really perform as advertised? Can an analog modem compete with ISDN? It is a question worth asking, but to really understand the pros and cons of this new technology, you need to understand a little about how it works.

Traditional Modem Basics

Traditional modems were invented long before the "digital revolution" hit the telephone industry. As a result, modems were designed to transmit data over a system that used analog technology to transmit sound. Early modems, called *acoustic couplers*, worked by placing a telephone handset into a cradle containing a speaker and microphone. Once the handsets at each end of the connection were in their cradles, the acoustic couplers at each end of the connection sent digital data by converting it to a very precisely *modulated* audio signal, then *demodulated* the signal at the other end, converting it back into binary data. The word *modem* comes from the first few letters of the terms *MOdulate* and *DEModulate*.

Traditional modems have come a long way since the days of the acoustic coupler. Modems of the 1960s transmitted data at speeds of 110 bps, but today's modems can send data at up to 33.6Kbps, more than 300 times as fast. Even so, their basic principle of operation remains the same. Modems still convert digital information into a precisely modulated analog signal, and that introduces some very specific limitations on how fast a modem can send data.

It's All Shannon's Fault

The problem is that at 33.6Kbps, traditional modem technology has all but reached the theoretical maximum transmission speed defined by Shannon's Law. Shannon's Law is an equation that proves that, given the way our modern telephone system works, the best data rate you can get out of a static and loss-free analog-to-analog modem connection is about 35Kbps.

Based on Shannon's Law alone, you would assume that today's new 33.6Kbps are about as good as modems that work with standard phone lines are ever going to get, and you would be right—except that the modern telephone system is not really an analog system anymore.

Today's telephone network is mostly digital, so instead of transmitting analog signals from one location to the next, the telephone system converts the analog signals generated by our telephones and modems into tiny "sound bytes," called *samples*, each 1/8000th of a second long. Then each sample is assigned a numeric value representing the electrical potential of the analog signal at the time the sample was taken. After being sent to the central office serving the phone line being called, the sample information is used to generate similar electrical potentials at the other end of the connection. These short bursts of voltage, when taken together, create a close facsimile of the original analog signal.

Sampling At 56K

If an analog modem could control the value of each sample it sent, it could achieve data rates of 64Kbps. What Shannon's Law shows, however, is because analog modems have no way of knowing when each sample begins or ends, modems cannot achieve that level of control. An ISDN digital device, on the other hand, can assign exact values to each sample, and ask the phone system to pass the specific corresponding sample voltage for that value on to an analog device connected to a standard telephone line.

That is how the new breeds of 56Kbps "modems" work—by using an ISDN digital device at the "central site" to set exact values for each sample. Since each sample can have up to 256 values, or eight bits of data, the theoretical "top speed" for this technology would allow for

> **Modems still convert digital information into a precisely modulated analog signal, and that introduces some very specific limitations on how fast a modem can send data.**

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line speeds of up to 64Kbps (8000 samples per second times eight bits per sample). In practice, however, other limitations of the phone system reduce the number of usable values by half, to 128 values, or seven bits of data per sample. Multiply those two numbers—8000 samples per second by seven bits per sample—and you get the magic 56,000 bits per second.

This is a radically different way of using a telephone line to send data. So radical, in fact, that the old moniker "modem" no longer really applies. Instead of "modulating" the signal sent from the ISDN-capable central site, the central site actually *encodes* it. So 56K "modems" no longer actually "modulate" and "demodulate" their signals, but "modulate" and "decode."

The Fine Print

The new 56K modem technology is fast when it works, but there are many limitations to this new technology. These limitations can force 56K modems transfer data at speeds well below 56Kbps, or even force them to abandon 56K operation altogether and run in standard analog modem mode.

The first of these limitations is that the "central site" location you are dialing in to has to have an ISDN line and equipment designed to work with the type of 56K modem technology you are using. With two different 56K modem philosophies out there, many Internet Service Providers and telecommuting managers are waiting for one definitive standard to emerge before investing money on new equipment. That means you are far from guaranteed that the ISP you dial into will support 56Kbps connections with your modem. (Do not worry that you will not be able to make a connection, though. If a location you are dialing in to does not support 56K connections, your modem will just "fall back" and work like a standard 33.6 or 28.8Kbps analog modem.)

Another limitation is that 56K modems can only send data at 33.6Kbps or less. Like any

> **Shannon's law is an equation that proves that, given the way our modern telephone system works, the best data rate you can get out of a static and loss-free analog-to-analog modem connection is about 35Kbps.**

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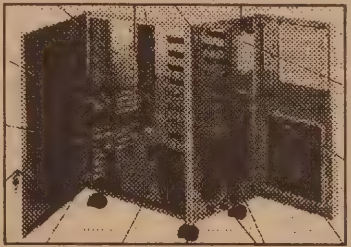

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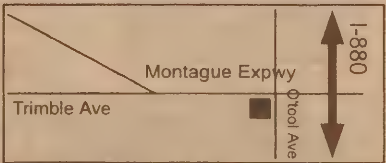

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other analog device, 56K modems still cannot establish the timing of the phone company's outbound samples. So, like any other analog modem, they are subject to the limitations of Shannon's Law.

The condition of your local telephone line is also a limiting factor. 56K modem technology requires a high level of precision in the voltage and timing of each sample. That means that the physical phone line used to connect a 56K modem to the central office cannot have special amplifiers to extend the reach of the phone line. These devices distort the integrity of the samples and force 56K modems to *fall back* and operate like a standard 33.6Kbps analog modem. So if your phone line is in a rural location, or even just on the outskirts of town, you may be out of luck where 56K modem connections are concerned.

Your phone service needs to be from a phone company's central office that is capable of managing the very precise signaling requirements of 56K. While this is not a concern for most phone company customers, not all central office locations can handle it.

Hotel and office PBX systems can also be a problem. PBX systems, which allow several telephone users at a single location to share a more limited number of telephone lines, often receive, sample, and re-transmit the central office signal to their local users. This destroys the integrity of the individual samples, and, once again, forces 56K modems to fall back to standard analog modem operation. (On the positive side, though, PBX systems that use ISDN lines instead of analog to connect them to the telephone company do not suffer from this limitation.)

Even on phone lines with none of these problems, there are still line conditions that can slow down a 56K modem. The most bedeviling of these is static electricity. Static comes from radio signals and other sources of electromagnetic interference that pass through your telephone line. Static causes subtle changes in the signal on the line, altering the precisely calibrated voltages of each sample. These distortions force 56K modems to use an even more limited number of the 256 voltage levels available to each sample. The result is that the modem falls back to a lower transmission rate that, while still faster than standard modem data rates, are appreciably less than 56Kbps. The 56K modem users I have spoken to tend to get connections that operate in the 42.6 to 48Kbps range, 15–25% slower than the advertised 56Kbps.

Lastly, even when everything else is working fine, FCC regulations restrict 56K modem technology to a top speed of 52Kbps. The FCC imposed these restrictions because of concerns that using the full 56K speed might overload the telephone system. If and when the FCC becomes convinced that this is no longer a concern, they will allow 56K modems to fly at full speed. Until then, though, FCC regulations will throttle 56K modem technology back to protect the integrity of the rest of the voice calls on the telephone network.

continued on page 60

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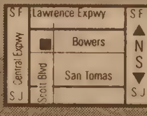

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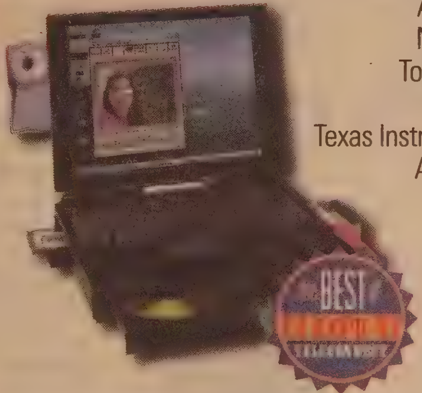

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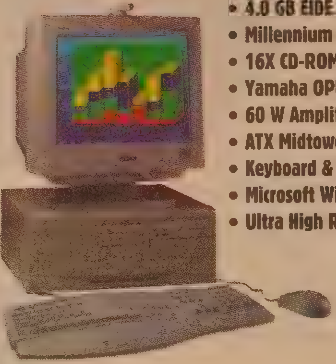

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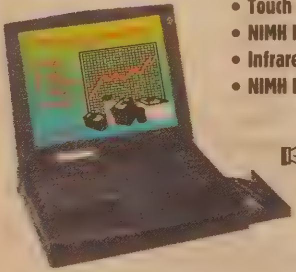

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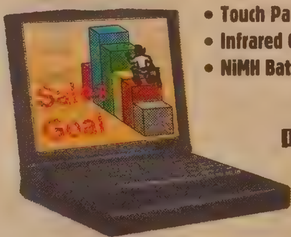

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Network setup, installation & on site service

Networking

continued from page 56

But Does Buying 56K Make Sense?

The upshot of all this is that 56K modem technology can provide substantial improvements in speed over conventional modem technology for some users, but not every user in every location. My take on this technology is that if you live in a metropolitan area and all you want is faster Internet access, 56K modem technology may be a good investment. Just be sure to check with your ISP and see if and which 56K modem technology they support before buying.

If, on the other hand, you are looking to 56K technology as a solution for remote LAN access, I think that 56K's spotty performance makes it a risky technology to invest in, particularly when there is another, standards-driven and proven technology that provides even better performance than 56K—ISDN. With ISDN adapter prices costing as little as $200, it just makes sense to invest in ISDN, particularly when you have to install ISDN at your central site to use 56K technology anyway. So my advice is to either skip 56K modem technology entirely, or to buy into a central site solution that supports standard analog modem, 56K and ISDN connections. That way you can provide true high-speed ISDN access to your power users who have a separate phone line for their computer and home office, while still providing the fastest modem technology available to people with just one phone line for their household. ■

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> Another limitation is that 56K modems can ONLY send data at 33.6Kbps or less.

RESOURCES:

Rockwell International's K56Flex Technology page:
URL: *http://www.nb.rockwell.com/mcd/K56/*

U.S. Robotics' x2 Technology page:
URL: *http://x2.usr.com/index.html*

The U.S. Robotics' x2 Line Test page
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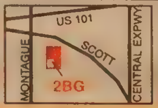

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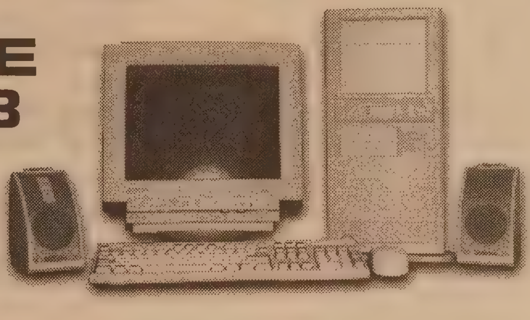

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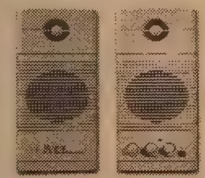

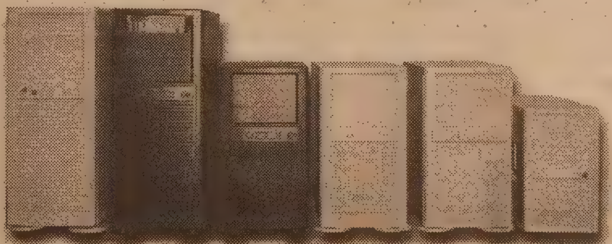

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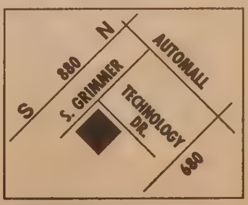

TELECOMMUTING • BY ROBERT MOSKOWITZ

Issues Of Security And Safety For Telecommuters

"Home Visits" Take On A New Meaning In An Era Of Telecommuting

An interesting trend among employers of telecommuters is the "home visit." Until recently, employers were concerned about what a telecommuter's home office might look like, but had no established model of procedures or parameters regarding how or when to check them out.

Today, more and more employers are recognizing they have a tremendous investment in their telecommuters' home offices, not only from the standpoint of the equipment the employer might own in those remote locations, but also in terms of safety and security issues there.

For example, if you're telecommuting to work from your home office and you trip over an extension cord, burn yourself with hot coffee, or come down with severe Carpal Tunnel Syndrome, there's every likelihood of a legal responsibility on the part of your employer. To my knowledge, none of this has been tested in court yet. But who could expect to prevail with an argument that an employer has no interest in the safety and security issues of employees working at home?

That's some of the background behind the changes now taking place in the world of telecommuting. It helps explain why several relatively large-scale employers are now directing their supervisors who have telecommuters on their teams to make plans to visit their telecommuters' off-site workplaces.

More and more employers are encouraging these site visits when their employees first begin to work from a remote site, usually as one small part of the approval process. An increasing number of employers are also asking for repeat visits to their telecommuters' homes at regular intervals, perhaps every year, every six months, or even every quarter—depending on the specifics of the situation and the nature of the work he or she is doing.

Because of the well-recognized and entirely legitimate concerns about privacy, visiting a telecommuter's home and inspecting his or her workplace is usually a lot more sensitive an issue than inspecting a workplace in a public telecommuting center. That's why employers generally seem to be bending over backwards to make sure they don't upset anyone or violate any employees' rights, while at the same time trying to make sure they are protecting their own interests by verifying the safety and security of their telecommuters' home-based workplaces.

Home Visit Guidelines

Currently accepted guidelines for site visits to telecommuter's home offices usually include some or all of the following items:

1. Supervisors should schedule the site visit with each telecommuter at a time of his or her convenience. For simplicity, the best time might be when other family members are away from the home. Don't force a visit when it's not wanted, but make clear that a visit must take place if telecommuting is to be allowed to continue.

2. Have a written checklist of items to be inspected, and limit your inspection to the telecommuter's workplace, and specifically to these items. This checklist will usually include:

a. Verify there is adequate electrical power and power outlets, work space, and access pathways.

b. Verify there is ergonomic lighting, seating, work-surfaces, and other work-related resources.

c. Verify power cords, work-related tools, filing equipment, office equipment, and items stored in overhead shelves or bins are safely arranged and secured.

d. Verify there are reasonable safeguards in place to prevent family members from getting hurt within the telecommuter's workspace.

e. Verify there are reasonable safeguards in place against loss or theft of the employer's proprietary data and equipment.

f. Verify there are reasonable safeguards in place to protect the confidentiality of matters related to the telecommuter's work.

3. Establish the degree of compliance with the employer's work rules for telecommuters

> Today, more and more employers are recognizing they have a **tremendous investment** in their telecommuters' home offices, not only from the standpoint of **the equipment the employer might own** in those remote locations, but also **in terms of safety and security issues there**.

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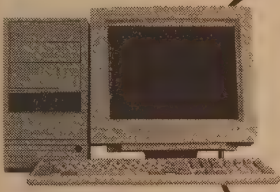

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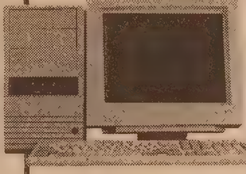

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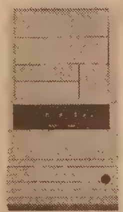
$989



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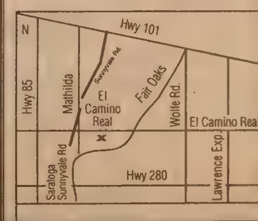

regarding taking home, storing, and using information, equipment, and other resources from the employer. For example: Does the telecommuter comply with the employer's rules regarding storage of company data on a privately owned computer?

4. Make a detailed inventory of employer-owned equipment and other resources being used at the telecommuter's workplace. Verify the presence or absence of dedicated telephone lines, fax equipment, telephone routing equipment, and other products and services paid for by the employer for the telecommuter's use.

5. Both the supervisor and the telecommuter should sign and date a site-visit form indicating that both parties were satisfied with the conduct of the site visit. Also, both parties should sign the complete inventory list to indicate they accept it as accurate.

The most ticklish part of conducting a site visit at the telecommuter's home is that it can compromise the atmosphere of "trust" that has previously been established between the telecommuter and his or her supervisor. To help prevent any compromise of this all-important trust, the supervisor should take pains to make clear that:

a) All telecommuters are being visited, not just a few who have been singled out for suspicion or verification.

b) No problems or danger signs have prompted the request for this site visit. The visit is a normal (although perhaps a brand-new) part of the employer's well-established and long-standing policy on telecommuting. It is merely one more aspect of the employer's overall efforts to help the telecommuter maintain a safe, secure workplace.

c) These visits are intended more to provide opportunities to improve the telecommuters' home workplaces, rather than an attempt to find fault with them or shut them down.

Two New and Interesting Phone Products

One of the biggest drawbacks to working as a telecommuter has always been the lack of "professional" telephone systems. It's bad enough to miss a call from an important client or customer. How much worse would it be if your 3-year-old daughter answers an important call, makes a few unintelligible noises in the caller's ear, and then leaves the phone off the hook without telling you?

So it's always exciting when new products come along to make the process of staying in touch with others a lot easier and more professional for people working as telecommuters in remote offices or at home.

Here are two I think will particularly interest you:

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continued on page 68

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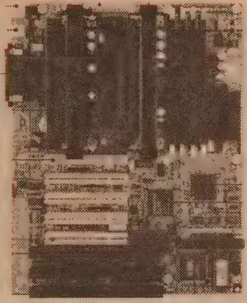

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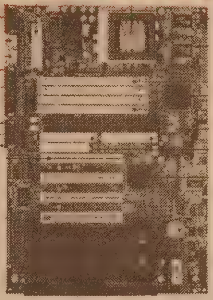

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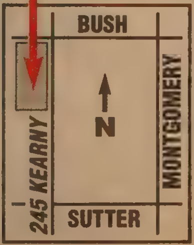

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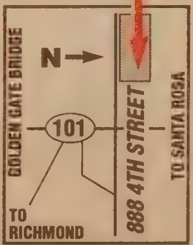

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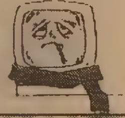

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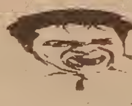

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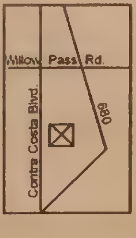

Product Spotlight

The AMD K6 Processor

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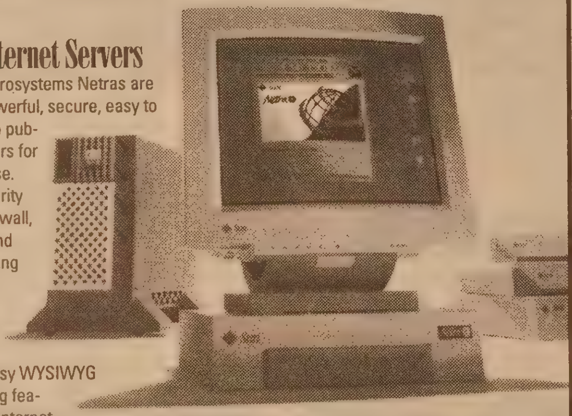

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Telecommuting *continued from page 64*

The SmartScreen is the simplest of the devices. It's designed to make more sophisticated use of telephone lines on which you've installed the phone company's messaging service, or "voice mail." You simply plug the SmartScreen into the line between your telephone and the wall jack. From then on, whenever a call comes in, SmartScreen lets you listen to the caller without picking up the phone. If you wish, you can immediately connect to the caller from any telephone on that line, even if he or she is in the middle of leaving a voice mail message. Finally, SmartScreen continually monitors your line and flashes a warning when you have voice mail messages waiting. So when you return from an absence you no longer have to pick up the phone and listen for the stuttering dial tone to find out if someone has left a message while you were out.

The SmartMonitor goes a step further and provides a very sophisticated form of call forwarding. Utilizing multiple telephone lines, the SmartMonitor effectively links your office phone to your cellular phone. With SmartMonitor in operation, whenever someone calls your office number, your cellular phone rings simultaneously. When you answer, you're connected to your own line as an "off-site extension." It's then your choice whether you'll listen in without being heard or "answer" the call as if you were picking up a phone in your office. You can even listen privately as the other party leaves a message on your answering system.

The SmartCenter is the most sophisticated element in this product line. Functioning as an automated switchboard, the SmartCenter lets your caller choose whether to leave a message, send a fax, page you, or connect to your cellular phone. This makes it easy to give people a single telephone number, and feel confident they can reach you no matter where you happen to go.

If you're part of a larger organization, the SmartCenter is extra useful because it provides a menu capability you can preset to let callers route themselves to other telephone lines for special handling of their specific needs, such as talking to a bookkeeper or an account manager. SmartCenter can also treat incoming calls differently on the basis of their Caller ID numbers, distinctive ringing, or the individual PIN numbers you can give to people who call you frequently. Calls from individuals or groups of people can then be selectively routed to an answering machine, or to a different phone number where you—or a person covering for you—can answer.

In addition, you can program the SmartCenter to change how it handles incoming calls, depending on the time of day and day of the week. For example, you can set it up to forward important calls to your cellular number during the days you're telecommuting, but forward them to your regular office during the days you're working there, and to an answering machine on weekends.

American Network Systems' "Total E-Call"

This is an extremely powerful hardware/software combination that turns your desktop PC into a sophisticated voice, pager, and email message management center. Once you've installed the adapter card, specified your email accounts and phone numbers, and plugged your telephone line and telephone into it (only a single line at present, but

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- Sound Blaster 16 PnP
- 120-Watt Stereo Speakers
- Jaton 33.6 Int. Fax Modem w/Voice
- Mitsumi 1.44 Floppy Drive
- Mid-Tower Case w/230W P/S
- MS Window 95 OSR-2
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Intel 120	**$1199**
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- MS Ergonomic Mouse
- Windows 95 (OSR-2)
- 15" N.I. Monitor Impression

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Intel 166/MMX	**$1549/1599**
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- Sound Blaster 32 PnP w/IDE
- 120-Watt Stereo Speakers
- U.S. Robotics 33.6 Internal Fax/Modem
- Teac 1.44 Floppy Drive
- Deluxe Mid-Tower Case w/230W P/S
- MS Ergonomic Mouse

Intel 120	**$1490**
Intel 133	**$1515**
Intel 150	**$1540**
Intel 166/MMX	**$1640/1740**
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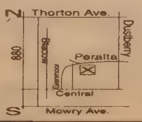

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Telecommuting *continued...*

a bigger brother of the device will soon be available to handle multiple lines), Total E-Call gives you impressive powers to stay in touch with your co-workers, clients and customers.

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2. Originate calls to any number of people in your Total E-Call database, play each one a recorded message of your choice, offer a chance to respond by pressing any one of the ten keys on the telephone number pad, and keep track of which key each one of them presses.

3. Record new voice mail directly through your telephone and send it to any combination of the people in your Total E-Call database, either through conventional voice mail (effectively extending your voice mail system to everyone with a telephone) or through email with a "voice message" attached. Note: The recipient need not have Total E-Call installed to hear the voice message you've attached to your email.

4. Use Caller ID information to identify a caller before you answer the telephone, and either a) respond with a message you previously recorded for that person alone, or for a group of people of which that person is a member, or b) pop up on the screen that person's detailed contact records, including notes on previous conversations you've been keeping within your Total E-Call database.

5. Receive a phone call, ask for a message, and forward that message to you at your then-current phone number, pager number, or email address (with the voice message attached), again with or without using a security code.

6. Respond to emails and voice messages from around the world through your telephone, recording your messages separately, then have each response sent to the intended recipients at specific times of the business day in their different time zones.

7. Keep automatic logs of the phone calls you make and receive, including manually or automatically recording any or all of what's said during these telephone conversations.

8. Do any of this on a date-and-time schedule you've preset. ■

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RESOURCES:

SoloCall "Smart" System
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URL: *http://www.solopoint.com*

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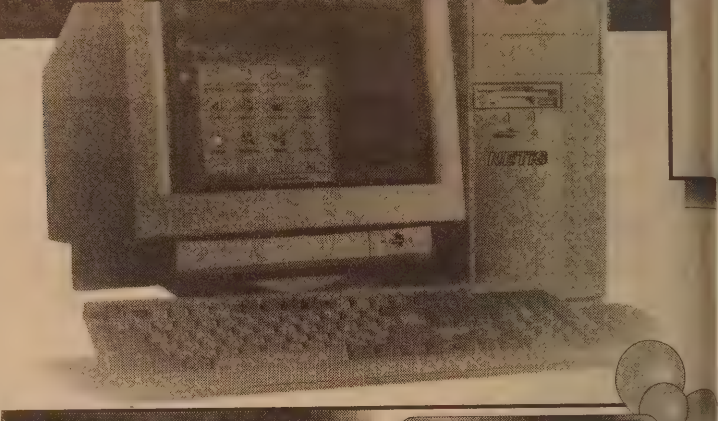

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PC World, January 1997

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UNIX • BY BENNETT FALK

Where Scalability Comes From

UNIX And Enterprise Computing

Toward the end of the month of May, Microsoft hosted something called "Scalability Day," a hefty marketing event aimed at convincing the people that run businesses that their businesses could be run on Windows NT, no matter how big the business in question might be.

Now a couple of observations are worth making about "Scalability Day." First, it's an event aimed at expanding NT's market share at the expense of UNIX; Microsoft is very eager to portray Windows NT Server as a cost-effective alternative to UNIX.

The second observation is that "scalability" is a very slippery word and that it should be treated with care. It is a word that exists in the weird twilight zone where marketing and engineering overlap.

> "Scalability" is a very slippery word that should be treated with care. It exists in the weird twilight zone where marketing and engineering overlap.

Marketing and engineering each have their own kind of gravity that pulls scalability this way and that. Marketing would really like for scalability to be something very general, along the lines of "No matter how big your business is, you can run it on Windows NT." Ultimately, marketing wants to make scalability a verb, to say of one's own product (whatever it happens to be) "It scales!" and to say of the competition "It doesn't scale." In this view scalability is a quality that things either have or lack.

Engineering, on the other hand, would like scalability to be something specific like a number—the number of transactions a given system can process in a second, or the increase in system capacity that will be gained by adding another processor. In this view scalability is something quantitative, a matter of degree.

Perennial divisions such as those between marketing and engineering or between quality and quantity will not be solved here. The best we can do is to shed some light on what our choices are and why we have to worry about things like scalability in the first place.

The Disappearance Of UNIX

On this latter question, I blame the disappearance of UNIX.

For most of this decade, UNIX has been disappearing. Not "going away," you understand, but becoming invisible.

Not all that long ago, the principal beneficiaries of UNIX were the people who used it interactively. The usable part of UNIX is a collection of simple tools that can be combined in new and interesting ways to meet the challenges of the moment.

The UNIX toolkit approach is life-enriching for some people and torture for others. When the Macintosh and the various editions of Windows introduced visually interesting, easy-to-use systems with standardized solutions for, say, 75% of the things a computer user might need to do, personal computers "took over" the desktop. The computers that most people actually use are now personal computers.

But the computers that people interact with are not the only computers in the environment. UNIX, as it has been displaced on the desktop, has moved to the data center.

The computers in a corporate data center are typically servers that don't expect to be used interactively by actual human beings. Instead, they host one or more applications (such as a Web server or a database management system). Between the human user and the application hosted on a server computer, there are client programs (Web browsers are a good example) that run on desktop computers. The client software manages all the user's interactions with the server part of the application. The real user of the server machine is not the human at all, but software clients.

Enterprise Servers

The UNIX industry's commitment to this "Enterprise Server" class of machine is indicated by a series of announcements that have appeared over the last few weeks from various UNIX vendors.

Hewlett Packard introduced the HP 9000 V-Class Enterprise Server. The V-Class servers are powered by 64-bit processors running at 200MHz and the V-class SMP (symmetric multiprocessor) architecture will support up to 32 processors. The V-class also features a high-performance backplane that shuttles data back and forth between the processors and memory at an alarming speed. The base price for a V-class machine is $170,000, and of course, the V-class computers run UNIX (HP-UX 11.00).

Sun began shipping its "Starfire" (or Ultra Enterprise 10000) line of servers in May. The Enterprise 10000 uses the 250MHz UltraSPARC processor and can accommodate up to 64 of them. Memory configurations range from 2GB to 64GB. The Starfire series runs Solaris, Sun's UNIX implementation.

And on May 18, IBM's Deep Blue defeated

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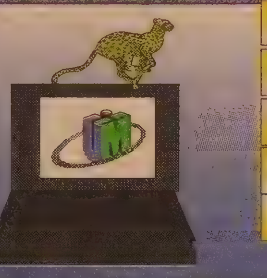

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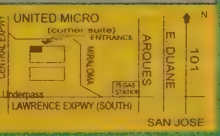

UNIX *continued...*

chess champion Garry Kasparov in a six-game chess match. Deep Blue is based on the RS/6000 SP, another multiprocessor computer. For the chess match, Deep Blue was configured with a total of 32 processors: two "wide nodes" running 135MHz processors supported by 1GB of memory and thirty "thin" nodes running 120MHz processors with 256MB of memory. Deep Blue runs IBM's UNIX implementation, AIX.

These are very powerful computers, and they cost a lot of money. Companies don't buy them for fun; they buy them because they can justify the expense.

Justifying the expense usually comes down to two things: performance and scalability. Establishing a computer's performance is a matter of figuring out how much work the computer can do and what it will cost to do that work.

Scalability, on the other hand, is a matter of figuring out the productive lifetime of the computer—how long it will be before the company's workload overwhelms the computer's capacity and a new computer must be purchased. If the computer's capacity can be expanded (as is the case with the all multi-processor computers mentioned above), how much additional capacity can be gained by adding processors?

Scalability And Enterprise Computing

In a sense, scalability depends on performance, and both performance and scalability depend on how the computer's work is measured.

In the old days, the unit of work was the interactive user; UNIX performance was a matter of how many interactive users could work with a machine simultaneously.

The trouble with this measure of performance is that the "interactive user" is a very difficult unit of work to standardize; some are reading news and cruising the Web, some are sleeping, some are nroffing their dissertations, some are compiling C programs, and some are hunting for eight-letter palindromes in /usr/dict/words. It's hard to arrive at a meaningful price/performance ratio when the unit of performance is so difficult to manage. Fortunately, UNIX disappeared from the desktop before all the UNIX vendors exhausted themselves in the attempt.

The trend toward "user-less" servers called for a new way of measuring performance. For server-class machines and the applications that run on them, the preferred unit of work is the "transaction." Transactions, like debiting or crediting an account, are an application-based (as opposed to "user-based") unit of work.

Unfortunately, transactions are almost as variable a unit of work as interactive users, and anyone who states a performance claim in transactions-per-second should be prepared to explain in the next breath just what they mean by "transaction.".

While transactions can be quite variable, however, they lend themselves more readily to standardization than interactive users do.

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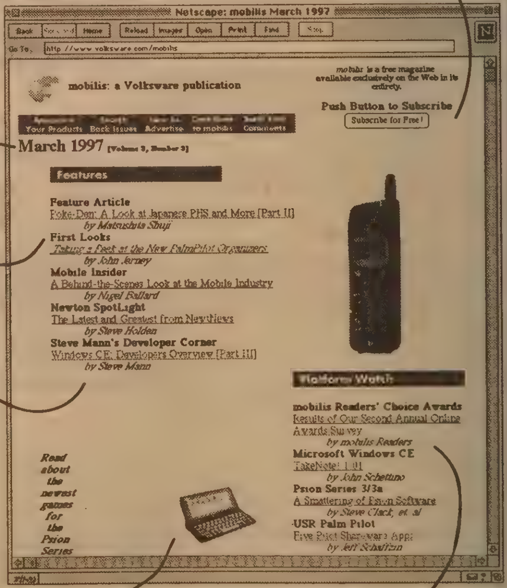

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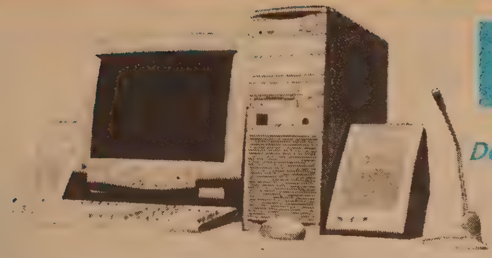

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UNIX *continued...*

Consequently there are organizations like the Transaction Processing Council (TPC) that have worked hard at standardizing transaction-based performance measurements. At its Web site the TPC maintains a spreadsheet of the certified results reported for the various transactional benchmarks it maintains.

But once we've measured performance in transactions per minute, what else must be done to arrive at scalability?

An announcement from Sun (also in May) illustrates the relationship between performance and scalability. Sun announced benchmark results for a suite of tests developed by Oracle. The Oracle tests measure a computer's ability to complete business processes simulating the work done in finance and manufacturing. The business processes are constructed out of fifty-seven different kinds of transactions that occur in finance and manufacturing applications.

The tests were run on an Ultra Enterprise 6000 computer configured for eight CPUs. With a load of 1100 client programs, the Ultra Enterprise 6000 could complete 190 transactions per minute. When configured with 24 CPUs the Ultra Enterprise 6000 could support 3000 users and achieved a throughput of 500 transactions per minute.

The point of this exercise is that performance alone isn't an indicator of scalability. The first scenario (1100 clients running against an 8-CPU machine) established the capacity of the baseline configuration. The second scenario showed that tripling the number of processors very nearly tripled the amount of work the system could do.

To arrive at some idea of how scalable a computer (or an application or an operating system) might be, performance must be measured repeatedly under conditions that are well understood and allowed to vary only in controlled ways.

Ultimately, scalability is about limits. We want to measure scalability to determine the capacity of a computer or an application to do work, and this capacity will not be infinite. Inexorably the law of diminishing returns kicks in, and the 20th, or the 32nd, or the 64th processor that is added to a computer will contribute less additional capacity than the second or third or fourth processor.

And for anyone who believes that scalability is about running any business, no matter how big, on an operating system, it might be helpful to remember that there was a time when businesses of every size could be run on no computer at all. ■

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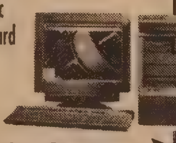

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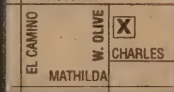

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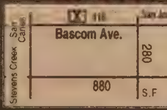

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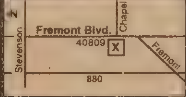

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Internet Research

How To Find It, Analyze It, And Write It Up Professionally

Research is power. As more and more information accumulates on the Web, moving around the Net with agility means that you can find things other people can't. Those people will gladly pay you to do so, because so many are still intimidated by the Web.

This month we look at four tools to facilitate research on the Internet. Two are new, and two are old friends that have come out in new editions.

NetResearch

Some of us just dive right in and start looking for something. That's fine; it is certainly my style. But we who jump in find that those who prepare themselves soon catch up and pass us, because they have surveyed the field first.

One very fine overview for online researchers is a book by Daniel J. Barrett called *NetResearch: Finding Information Online*. It is an O'Reilly book, and that is always a good sign; O'Reilly books have less fluff in them than most computer publications.

Most tomes in the research field would have long lists of Uniform Resource Locators (URLs) that you suspect the author has cut and pasted from someplace online. Since Web sites appear and vanish like spindrift, these books are out-of-date when they hit the street and grow more obsolete by the week.

Barrett's book is different—he offers a meta-view. He writes about how to approach online research itself, rather than just about how to find specific information. His goal is not to produce good research. His purpose is to produce a good researcher. As such he tries to train your investigatorial intuition. I know Barrett's techniques work because I've happened on a few of them myself over the years, but I've never seen them all in print before.

Instead of telling you to try this or that site, he tells you how a shrewd researcher can guess where good sites might be hidden. He has a useful brief section on guessing the probable URL for a given company or academic institution. He gives very effective tips that will save the beginner hours in investigating a topic; one is to find and read FAQ files, the compendia of Frequently Asked Questions that are put on the Net by experts and knowledgeable amateurs. When Barrett does give lists, they are particularly useful. One is of Internet country domains. You probably knew that Switzerland is *ch* (for Confederation Helvetica) but did you know that Antarctica is *aq*?

Barrett has recruited some skillful collaborators. These are men and women who have used the features he is talking about, and whose adventures with them are summarized in the book. Instead of just one viewpoint, you get to hear from users of different temperament and experience. Barrett devotes a whole chapter to finding people through the Internet. One of his contributors tells of catching up with a colleague who was at a conference in Scotland, hopscotching around the Web until she found a way to reach him.

There are two obvious markets for this book. One is the beginning investigator who wants an overview of the Web as a research tool, and a definition of terms. Barrett does that well. A second market is the seasoned Web walker. The difference between an adequate online researcher and an inspired one is that the genius can always think of one more approach to the problem. Barrett helps you find that one additional way.

WebCompass

At this point you might be saying to yourself, "Why doesn't somebody design a program that will do all this work for me?"

Well, someone did, and Quarterdeck has published it.

At the beginning of the year, we predicted that 1997 would be the year of intelligent agents. WebCompass is one of them. It is a program that will go online and do a brute-force search for your topic. It will go everywhere that you can think of and come back with all known instances of your search terms. There are thirty-five search engines that WebCompass will invoke in pursuit of your topic, if you wish. It does the kind of thorough perusal of online resources that you know you should do but do not have the patience for.

When you first invoke WebCompass, you are offered a tutorial, which is worth taking. It shows you how to get around in WebCompass, and how to configure it for your own uses. But WebCompass will reward even the beginning

In NetResearch, Daniel Barrett writes about how to approach online research itself, rather than just about how to find specific information. His goal is not to produce good research. ***His purpose is to produce a good researcher.***

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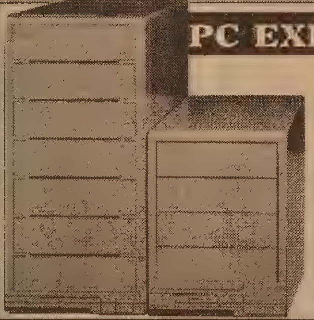

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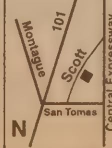

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user, because its resident wizard will guide you through an elementary search.

You begin searches by naming a topic. The name becomes the first search term that WebCompass will pursue through the Internet. You can add as many other query terms as you want. Then you set the agent loose. It sends the search terms off to various search engines. Alta Vista, Lycos, HotBot, InfoSeek and many others are consulted.

When WebCompass has gotten as many hits as it can from the various search engines, it first eliminates duplicates from the catalogue. Then it sends for copies of the Web pages it still has on its list and makes summaries of them. I am not sure what artificial intelligence program it uses to make those summaries, but it seems more sensible than that in (for example) Microsoft Word's summary-maker. Finally, this edited summation is presented to you.

You are invited to look at the list and delete those pages that are obviously not relevant to what you are doing. You can also summon the pages that seem possibly pertinent. WebCompass looks over your shoulder as you do both the deletions and the summonings. It is refining its internal idea of what you want, because it is not yet done. It will go out and look for more pages on this same topic in the future, as often as you wish it to do so (daily, weekly—you choose.) It will not again retrieve the pages you have rejected by deletion. It will look for new Web pages on the topic, and for revisions of old pages that you that you seemed to like on its earlier searches.

It can also look for Usenet articles, ftp files, and gopher sites. With a little presetting, you can get the program to search most of the available Internet for any topic of interest to you.

My research deals with a wide variety of unrelated topics. I need to find people of whom I have never heard before. I need to find unusual organizations, or peculiar documents. I could laboriously construct a search strategy for each of these tasks, or I could unleash WebCompass. WebCompass has reduced my initial search time by a factor of ten. The program orders its results by its best guess of relevance. People I need to find not only appear on WebCompass's results list, but they appear at the top.

The price? $50. Nope, that is not a misprint. Half a C-note will buy this. Amazing. How do they make money giving such products away?

If you have almost no patience with research, but you must do it anyway, WebCompass is your tool.

NUD*IST

Several months ago, research maven Tim Lavalli and I wrote an article (See RESOURCES for a pointer to the online edition of that review) about software tools for a special sort of inquiry. Called "Qualitative" research, it concentrates on meaning and nuance rather than numbers. It has many varieties, but most of them involve working with texts. The researcher reads the text and finds what seem to be themes. The motifs are gathered together into groups or categories.

continued on page 85

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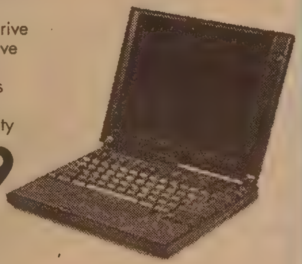

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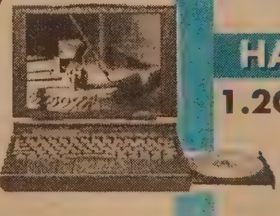

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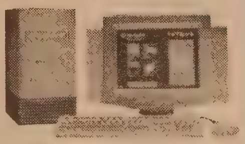

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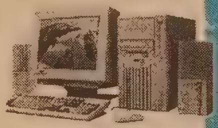

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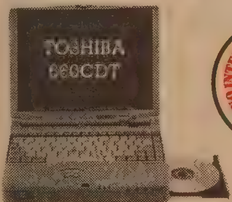

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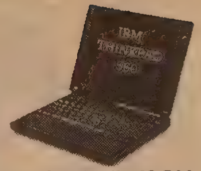

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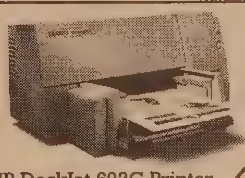

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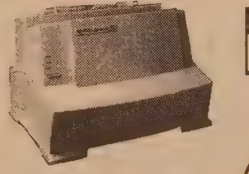

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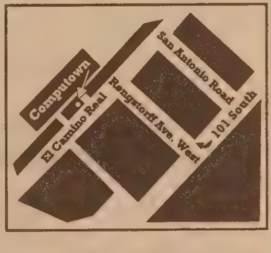

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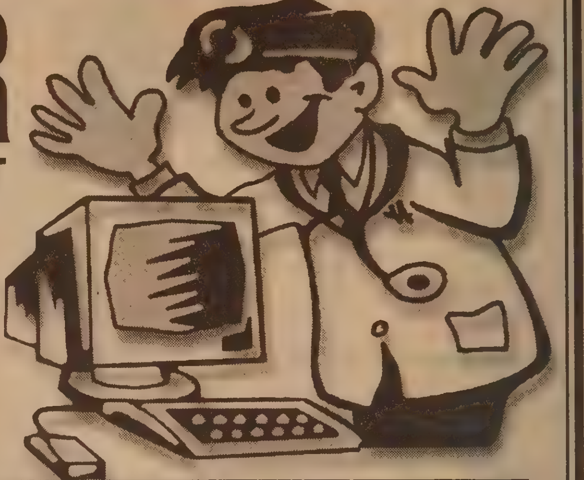

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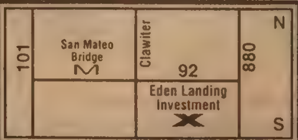

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continued from page 80

A sort of hierarchy evolves as the researcher returns again and again to the text to find new shadings of meaning and to ask new questions. "Qualitative" research is favored by those who dislike a merely numerical approach to reality, and also by those looking for ideas that may later become the basis of quantitative research.

One of our favorite software tools was version 3 of NUD*IST, the software with the unforgettable name. Just as our article appeared, so did a new edition of the Non-numerical Unstructured Data Indexing, Searching and Theory-building program. Version 4 has a number of improvements that make NUD*IST even more usable for business researchers.

"Great name. What does it do?" NUD*IST is a program for marking up text with ideas and keeping track of the ideas in an ordered way, with each notion connected to its supporting text. After you import a text file into NUD*IST, you can mark various sections of text with "nodes" that represent ideas. This process is called "coding." Then those nodes can be gathered together under superior nodes that represent higher-level ideas. It is easy and quick to move these nodes around, so you can very quickly rearrange your thinking. The real advantage is that you can at any time create a report that collects all the text in support of any given idea.

> **WebCompass has reduced my initial search time by a factor of ten.** The program orders its results by its best guess of relevance. People I need to find not only appear on WebCompass's results list, but they appear at the top.

You can have NUD*IST automatically code large bodies of text. You must write short command files to take advantage of this feature, but they are not impossible and there are many examples provided. The command files can vastly simplify the annotation and coding of the huge sheaves of text one can gather in a Web search.

The new version of the program provides additional tools for getting quantitative results as well as qualitative. You can create a report on the number of Web pages that mention Madonna and do not mention Argentina, and export it to other programs for further statistical analysis. This extension is particularly valuable for those of us who wish to use both qualitative and quantitative approaches. You can also import quantitative or database data and pre-create categories based on the imported information.

NUD*IST takes more than an afternoon to learn, and Tim Lavalli warns that the steep learning curve and high cost can make it a bad choice for a single project. It also is not ideal for visual data, as it is rooted in a computer language called LISP that is rich in textual tools but poor in graphics.

If you need to understand and code text, with detailed proof for your assertions, and if you need to do it again and again, then NUD*IST can be exactly the tool you need.

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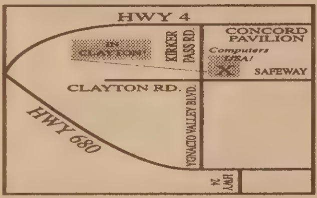

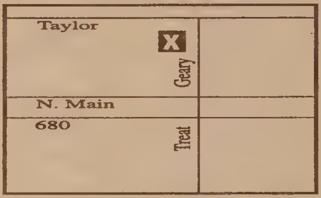

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Once you have created a search strategy, found your sources, and analyzed the text in them, you need to publish your work. In all too many cases, that means you will need to write footnotes and bibliographies.

Doubtful readers will want to be able to check your sources for themselves. Enthusiastic readers will want to follow up on your brilliant discoveries. Both kinds will want to know where you looked, and from whom you learned.

If there were only one format for citations, life would be so simple. Instead there are hundreds of formats, differing in tiny, maddening ways. If you want to submit your research to the *Journal of Anaphylaxis*, you must follow their format for citations or they won't even look at your work.

Enter EndNote, in Mac or Windows versions. EndNote allows you to create a citation database. When you want to enter a citation in a paper, you can just highlight the citation in the database and copy it to your paper. It appears as a bracketed cite. When you wish to format the finished project, EndNote will go through the whole document and put all the notes and the bibliography into proper form.

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There's lots more to EndNote. Its latest version bundles EndLink, a utility that lets you collect citations online and import them directly into the database without having to retype them. The newest Windows version will work as an add-in to either Windows for Office 97 or WordPerfect. ■

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RESOURCES:

"Beyond Beancounting,"
by Birrell Walsh and Tim Lavalli
MicroTimes #162
URL: *http://www.microtimes.com/162/research.html*

Tim Lavalli is a qualitative research consultant. He can be reached at *stltim@tmn.com*.

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Court Decision Supports Programmers; Complicates Life For IT Industry

Temps may be more than second-class employees. Large companies in technology industries have increasingly adopted the practice of hiring programmers and engineers as independent contractors to avoid payment of employee benefits.

This practice has lit the fires of a number of hot legal, tax, and regulatory issues, recently exemplified by *Vizcaino vs. Microsoft*, a class-action suit in which eight freelance workers prevailed (so far) against the software monolith after learning what benefits their cubicle-mates got that they did not.

The Ninth Circuit Court of Appeals acted to protect independent computer industry professionals who lack bargaining power against corporate giants. The decision thrilled many programmers and other contract service providers; however, the predictably defensive response from the largest and most influential hi-tech companies is delaying total resolution.

These poor, beleaguered megacorps accuse the Court of attributing to Microsoft a Dickensian anti-labor attitude. Whether Microsoft is a benevolent giant or the Evil Empire, its political clout—and industry lobbying—may have influenced the granting of a rare, post-appeal, full court rehearing that has been recently announced.

Although there are only eight named plaintiffs in *Vizcaino vs. Microsoft*, the class they represent may include hundreds of Microsoft workers. The case has been widely reported in the press and is likely to be one of the most important legal decisions to affect contract professionals and their employment relationships.

There has been much confusion and misinformation about the case, which is considerably more complex than its coverage in the popular press would suggest. You can read it yourself from the horse's mouth at URL: *http://www.vcilp.org/Fed-Ct/Circuit/9th/opinions* , where 9th Circuit Court decisions are available.

Roots Of Controversy

Microsoft employs a core staff of technical and other workers which it categorizes as "regular employees." They receive a wide variety of benefits, including the usual paid vacations, leave, holidays, short-term disability, health and life insurance, and pensions. Regular employees can participate in a 401(k) retirement plan in which Microsoft matches fifty percent of employees' eligible contributions, and in a stock purchase plan wherein they purchase company stock significantly below market value. Microsoft also pays various employment taxes for its employees, as required by law.

The core staff is supplemented with a pool of programmers, engineers, and other technical workers who were classified as "independent contractors" or "freelancers," including the eight named plaintiffs. The company does not provide them with any of the benefits received by regular employees.

> **Whether Microsoft is a benevolent giant or the Evil Empire, its political clout—and industry lobbying—may have influenced the granting of a rare, post-appeal, full court rehearing that has been recently announced.**

The plaintiffs were not short-term or part-time employees. Although initially hired to work on specific projects, after these projects were completed they had each been assigned, successively, to new projects. All but one of those named had been working for Microsoft for at least two years. They were fully integrated into Microsoft's workforce and were required to work on site. Rather than being paid through Microsoft's payroll department, however, they submitted invoices.

Microsoft never officially communicated the regular employees' benefit plan to the plaintiffs. On the contrary, when they were hired each was told that he or she would be ineligible for benefits. All eight plaintiffs had signed statements describing themselves as independent contractors and acknowledging responsibility to provide for their own insurance, taxes, and benefits.

Eventually, the workers learned of the benefits provided to regular employees. Moreover, they learned that the heroic IRS had examined the company's employment practices and had concluded that Microsoft's freelancers were not independent contractors but were, rather, common-law employees for purposes of withholding and income taxes.

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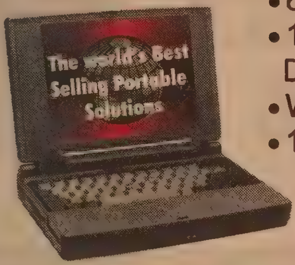

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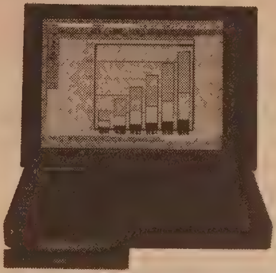

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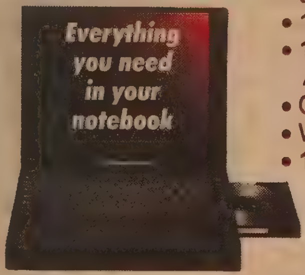

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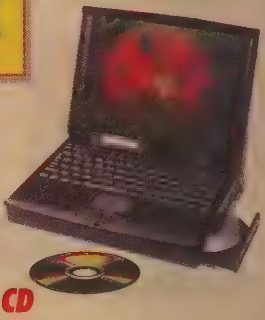

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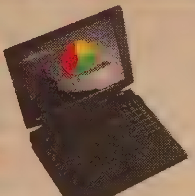

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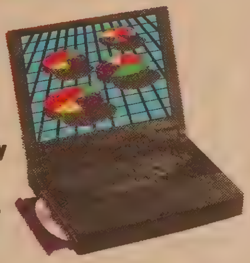

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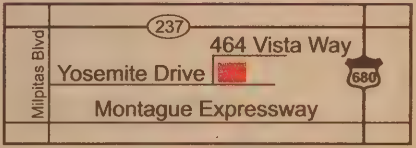

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Accounting

continued from page 88

Where Do You Want To Go Today?

In response to the IRS rulings, Microsoft began "converting" its independent contractors. That is, it tendered permanent employment offers to some. Other freelancers were given the option of terminating their employment relationship with Microsoft completely or continuing to work at the company as employees of a new temporary employment agency (a so-called job shop).

The job shop would treat the workers as its own employees and pay the employer's share of payroll taxes. However, the job shop offered few perks, if any, and the workers would still not be eligible for the disputed fringe benefits. While some went along with this arrangement, at least one, Donna Vizcaino, simply refused to deal with the job shop. Microsoft promptly fired her.

Some of those fired or forced to work for the job shop sought judicial review of the denial of benefits. Microsoft, in the ensuing litigation, rejected the plaintiffs' claims for benefits, maintaining it was not part of the deal.

> Freelancers were given the option of terminating their employment relationship with Microsoft completely or continuing to work at the company as employees of a new temporary employment agency (a so-called job shop).

The trial court sided with Microsoft, as follows:

First, the contract between Microsoft and the plaintiffs specifically stated that no benefits were provided by Microsoft. Second, because the terms of the [benefit] plan were not communicated to the plaintiffs, they could not have become part of the contract between them and Microsoft. Thus, the plaintiffs had no expectation of receiving any benefits.

Following this defeat, the workers appealed (for technical reasons, the appeal pertained only to certain benefits).

Microsoft's welfare benefit plan provided that "Each employee who is 18 years of age or older and who has been employed for six months shall be eligible to participate in this Plan," and defines "employee" to mean "any common-law employee who receives remuneration for personal services rendered to the employer and who is on the United States payroll of the employer."

Microsoft conceded that the workers were generally common-law employees who rendered personal services to Microsoft. Because the plaintiffs were all over age 18 and had all been employed for more than six months, the Court reasoned, "the issue before us is only whether

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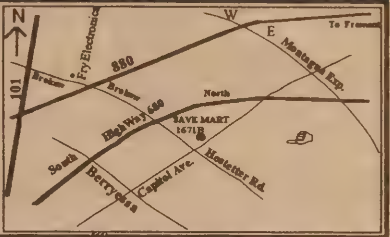

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they were 'on the United States payroll of the employer.'" The term "on the United States payroll," however, is not defined in the plan.

The Court said that provisions of the plan should be interpreted in an ordinary and popular sense as it would be by a person of average intelligence and experience. It then turned to the 1980 edition of the Random House Dictionary, and found that payroll means "a list of persons to be paid, with the amount due each."

That was clear and ordinary enough for the judge, who concluded that Microsoft's benefit plan should reasonably extend to these freelancers. Moreover, the court would not allow Microsoft to argue a different definition for "payroll," saying that would merely create an ambiguity in the term "payroll." Under various legal principles, interpretation of an ambiguous phrase would be resolved in favor of the workers.

Because the plan extends participation to all common-law employees, the non-regular workers are entitled to enjoy the plan as would any of Microsoft's employees who are paid through the payroll department. The court found:

(1) Even though the plaintiffs had signed papers designating themselves as independent contractors, that label does not control their employment status; and

(2) If the signed papers were found to exclude the plaintiffs, this exclusion would conflict with the benefit plan, which provides coverage for all eligible employees, and could result in loss of the plan's tax-favored status.

Poor Mr. Bill

As explained in the dissenting opinion, Microsoft has a payroll department, and it has a separate accounts payable department. Because the plaintiffs were regarded both by Microsoft and by themselves as independent contractors, Microsoft did not budget or pay for them through the payroll department.

As freelancers, the plaintiffs worked for Microsoft with the understanding that they were not entitled to the benefits for which they sued. One legal commentator quipped, "The Bible tells us it is a sin to hold a worker's wages overnight. It does not tell us that the worker must be paid something more than was agreed."

Indeed, contract techies typically assume—or hope—compensation is high compared to a regular employee's wage, to make up for the fact they don't receive benefits. In essence, Microsoft may have felt double-charged, believing it had contracted to pay the workers a premium in lieu of benefits, and then finding out that it had to provide the benefits nonetheless. The plaintiffs may have realized a windfall.

Temp Workers Of The World, Unite

The Court of Appeals decision was written by Circuit Judge Stephen Reinhardt, who, by reputation, abhors abuses to which independent contractors are often subject.

Microsoft's strategy was to try to limit the case to a technicality over the meaning of the words "United States payroll" as used in many employee welfare benefit plans. Judge Reinhardt, however, was more concerned with issues of contractual fairness when independent contractors have to deal with large corporations. He pointed out that the parties have unequal negotiating power, unlike cases in which employment agreements are collectively bargained for. If Microsoft ruled labor practices as it does the PC, it would be too easy for all employers to circumvent employee benefit coverage requirements and deny plan benefits to its common-law employees.

Conservative commentators hold that the court's decision amounts to a flakey interpretation of a contract. They find it hard to see ambiguity in an employment agreement specifying that employee benefits are not part of the compensation. Following this reasoning, however, Microsoft might then be exposed to disqualification of its benefit plan by the IRS, for failure to meet minimum participation requirements.

Microsoft's employee benefit plans were set up the way they were in order to qualify for substantial tax benefits to the company. Congress intended to limit those tax benefits only to employee plans that are nondiscriminatory. Now Microsoft wants to exclude some common-law employees but not others, yet still retain all the tax benefits of a plan that doesn't discriminate.

The Ninth Circuit's decision was certain to be controversial. It has raised the ire of the employee benefits industry, which tends to ally with big business. The decision threatens to complicate employers' compliance with qualified benefit plan rules, and raises the specter of major liabilities to employers who run afoul of minimum participation requirements, as well as threatening huge potential payroll tax liabilities.

Oakland labor attorney Arthur Lazear would not offer Microsoft a single byte of condolences. "Society and the government have a substantial interest in labor contracts. The Fair Labor Standards Act and child labor laws are designed to grant rights that cannot be given up in response to pressure from employers. ERISA, the legislation that protects the right of workers to obtain benefits, is similar legislation."

Don't Try This At Home

If you have supplied technical services on a long-term contract basis, you may be wondering if you should sue to recover the value of employee benefits that you never received. The answer depends, in part, upon whether you wish to remain employable.

The named plaintiffs in the Microsoft case represented perhaps hundreds of workers who

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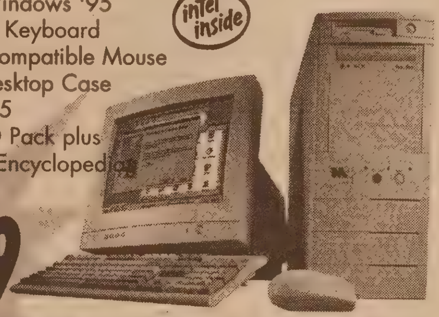

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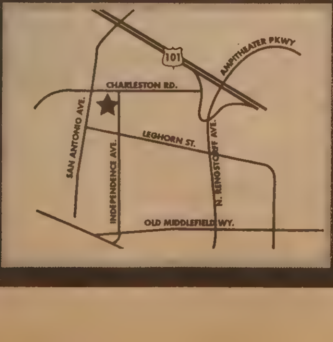

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the court certified as a class, and who are able to maintain a degree of anonymity. In general, however, many employers may tend to disfavor engaging applicants who are apt to turn around and sue them. Ordinary consultants who depend upon goodwill and personal relations in a small business community should be cautioned before attempting such a feat.

Tim Hoffman, another Oakland attorney specializing in employment and benefits litigation, says the system makes it all too easy for very large employers to have their way with workers who don't bargain collectively. The most powerful tool now available to curb abuses after the fact is a class-action lawsuit.

As more such actions are brought, however, employers will immunize themselves with new defensive tactics. Ultimately, *Vizcaino vs. Microsoft* could prove a mixed blessing for independents.

Already, many contract techies complain that it's hard to get hired unless you're incorporated. This case could be to turn up the screws. For the small service provider to incorporate and navigate around a host of complicated restrictions designed for employee leasing agencies and personal service corporations, and ensuring that the corporate entity will be recognized for tax purposes, a substantial burden may be added to the cost of doing business. ■

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Vizcaino vs. Microsoft Corp., 97 F.3d 1187 (1996).

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Alvin D. Lurie
"Not A Soft Landing For Microsoft"
73 Tax Notes 1359 (December 16, 1996)

Lee A. Sheppard
"Dependent Contractors, Part 2: 'Microserfs'"
96 Tax Notes Today 206-6 (October 22, 1996)

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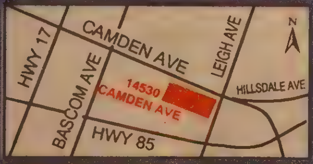

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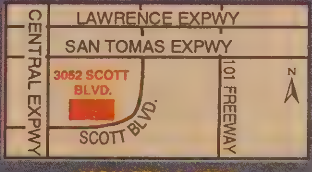

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BY ROYAL P. FARROS

The Making Of An Internet Startup: Part IX

Assessing The State Of The Internet

Quick iPrint

Update: More strategic partnerships. More Web site awards. More happy customer letters. And a lot more work to do in front of us!

The State of the Internet Message

The best summary of the State of the Internet is the cover of *WebWeek* a few issues back. The cover story on the left talked about the bankruptcy of high-flying Jim Manzi's Nets, Inc. On the right the story told of the insatiable demand on Wall Street for the Amazon.com offering.

Acronyms are colliding: GBF means "Go Broke First" as much as it means "Get Big Fast." It's the infamous "Internet Time" at work. In fact, if M.C. Hammer recorded "Internet Time" instead of "Hammer Time" a few years back, he would have filed for bankruptcy *before* the video was released. (What's the worst lyric to a creditor's ears? "Can't touch this!")

Or maybe it means that the industry is going through another one of those all-important, transitional "inflection" points? Clearly some companies are "getting it," that is, figuring out how to do business on the Internet, while others have just learned how to efficiently go through gobs of venture capital with little to show for the effort.

> Acronyms are colliding:
> **GBF means**
> **"Go Broke First"**
> as much as it means
> **"Get Big Fast."**
> It's the infamous
> "Internet Time" at work.

Here are some general observations and hard-fought lessons as we circle the mid-way buoy of 1997.

Living On Internet Time

If Einstein were still around, he might have restated his famous equation to "E=mI2" where "I" is the speed of development on the Internet, sometimes considered as fast as light.

Things on the Internet are instantaneous, at least relative to doing business for the desktop. Like a shark, smart companies do everything it takes to keep moving forward. Those that lose momentum suffocate.

Of course, we all know this is the case for development. But everyone's marketing and sales departments should feel *frenzied* as well. The smart companies are taking handfuls of spaghetti and throwing them up against the wall to see what sticks. Experimental relationships. Experimental promotions. Experimental price schedules. Hey, this is the Internet; if it doesn't work, it's easy to change—and fast.

If At First You Don't Succeed...

It's well-chronicled that Microsoft pulled off one of the most stunning and spectacular feats in all of business history when it was able to turn on a proverbial dime. Literally, overnight, Microsoft became an Internet company.

All of a sudden Microsoft's previously infallible strategy seemed tired, so Bill fixed it, even though he had a lot more momentum *against* this change than almost everyone *combined* in the software marketplace.

Like Microsoft, Internet winners are constantly revisiting their objections and evaluating their progress. Once an admirable trait, dogged determination is simply putting some companies in the dog house. Recently, however, I get the sense that this is happening at heightened levels: Almost everyone I speak with is "reviewing" their business propositions. (Another clue we're at an inflection point.) While this is short-term bad news for the industry, the smart companies that are doing this stand the best chance for survival in the mid- to long-term.

Banner Blues

After a few months of light advertising, I can say with certainty that a fast way to lose money is to do a little advertising. Unfortunately, you can't scale to critical mass just by taking small bites. This presents a difficult dilemma for all of us trying to be sensible with our investment dollars: We need to get our name out in front of the public, but we're not ready to go broke doing so.

We're taking a fairly disciplined approach when it comes to advertising. We're experimenting, and we're tracking. There's no doubt that we'll eventually spend a lot of money on banners, but we'll do it when we get a sense of what will work and what doesn't.

Will we miss the opportunity to establish our brand identity before other competition comes into play? Possibly. But given our aggressive co-partnering and press strategies, we'd like to think we're taking the *effective*, balanced approach. We want to Get Big Fast, not Go Broke First.

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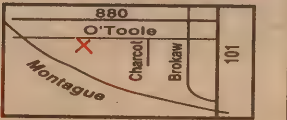

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I'm happy to say that the buying public is past the media-driven credit card security scare. We've gotten about a handful of emails from people who said they weren't ordering because there was no alternative to entering a credit card online, an insignificant number relative to our total orders to date. Indeed, people like doing business online just fine.

One important note, though: What *enables* this trust is responsive, "no bull" customer service. Everything from answering customer emails quickly, to getting the goods delivered as and when promised. People don't trust technology; people trust people.

> The smart companies are taking handfuls of spaghetti and throwing them up against the wall to see what sticks. **Experimental relationships. Experimental promotions. Experimental price schedules.** Hey, this is the Internet; if it doesn't work, it's easy to change—and fast.

The State of the Internet

All the signs are positive *but* the dollar signs. The only "magic formula" that's working is selling the building blocks to existing Internet companies.

This doesn't mean that e-commerce isn't working... it most definitely is! But, like any business, it takes time and intelligence to grow. The best news that I can report about the State of the Industry is that for the first time that I can recall, Internet companies are finally thinking with their business hats and not their bank accounts. And that's a great sign for the future. ■

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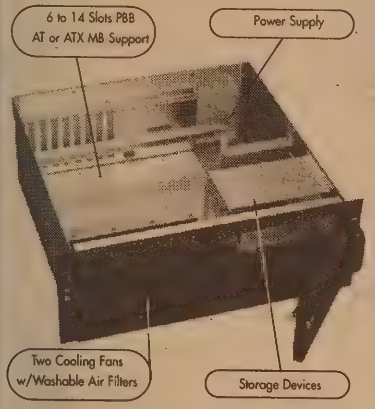
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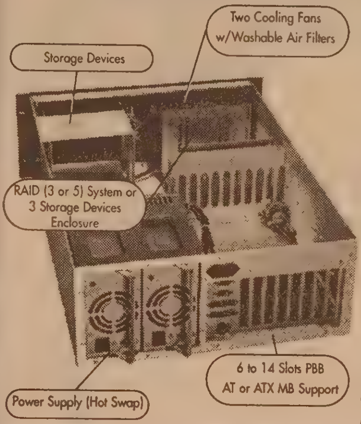
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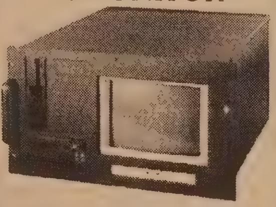

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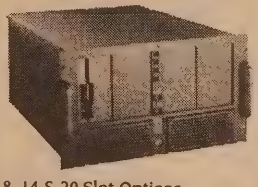

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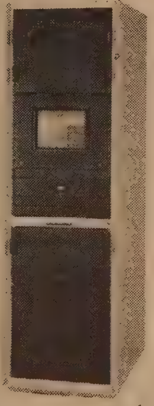

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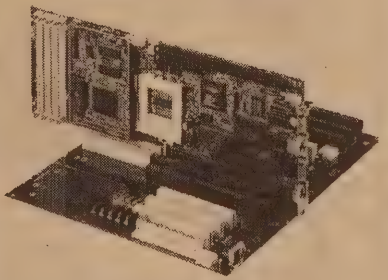

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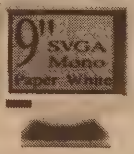
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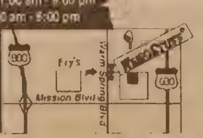

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Hurry Up And Wait

The Wireless Market Evolves

The most common PC of the new paradigm will be a digital cellular phone. It will be as mobile as your watch and as personal as your wallet; it will recognize speech; it will navigate streets; it will collect your mail and your paycheck; it will conduct transactions. It will command an Internet address and a Java run-time engine. It will link to a variety of displays, keyboards, and other input-output gear through radio frequencies and infrared pulses. Every device will be able to link to every other one, like a telephone."

—George Gilder, "Telecosm and Beyond: Over The Paradigm Cliff," *Forbes ASAP*, URL: *http://207.87.27.10/asap/97/0224/029.htm* .

* * * * *

At last month's CSPA (*http://www.cspa.com*) conference on "Emerging Platforms for Interactivity and Connectivity," Unwired Planet (*http://www.unwiredplanet.com*) CEO Alain Rossmann demoed his company's technology to an intensely interested audience.

Partnering with a number of telcos with wireless offerings, Unwired Planet helps turn a cellular phone to a universal communicator. In a real-time, non-canned demo, Rossmann got on the Internet with his cell phone, checked and answered email, made calls requested in said email, and incidentally researched movie listings in Tacoma. He didn't make reservations, but he could have.

The burning question on everybody's mind was where they could go buy one of these fine gizmos. The answer, alas, was that for the present, the product is only available to corporate accounts in large quantities; the consumer-market implementation is still some time away. Nonetheless, between potential business partners and prospective customers, Rossmann was mobbed.

As Rossmann's in a fine position to attest (longtime readers will recall his appearance on our cover in January 1993 touting the EO Personal Communicator, which disappeared with its parent company into AT&T shortly thereafter), wireless communications represent a hot, promising, and perilous market.

Indeed, as suggested by the cover story on Hedy Lamarr, whose 1941 invention is only now coming into its own, it's very difficult to predict where and when technical excellence, clever application, consumer demand, and affordable pricing will converge in a successful product.

Hordes of hopeful vendors pursue the holy grail of untethered communications with pagers, cell phones, PDAs, wireless modems and a host of other devices, but for every successful breakthrough (e.g. U.S. Robotics' Palm Pilot) there's a myriad of promising but failed products. On the other side, entire mobs of would-be customers pursue the impossible dream of finding an affordable product that does something they actually need, as contrasted to a cool toy. In the middle are a lot of problems and solutions in search of each other, with the advent of the Internet adding a frenzied quality to the quest.

So far, the successful companies seem to be finding a manageable niche—whether it's high-end global communications or consumer-oriented Net access—rather than attempting to solve huge problems. The entire market is clearly in its infancy, its growth simultaneously driven by huge potential demand and limited by very real technical and economic factors.

Not long ago, Dave Hughes (*dave@oldcolo.com*), often featured in these pages as a tireless advocate and implementer of spread-spectrum technology in the unlicensed frequencies and a dauntless defender of their license- and fee-free status in the face of FCC auction plans, spoke at a meeting of Smart Valley in Palo Alto.

At a time when telephone companies were bemoaning the fact that demand for Internet connectivity was fast exceeding their ability to supply service, and suggesting that the next infrastructure update should be financed by imposing higher charges on ISPs, Hughes demonstrated how devices utilizing the same spectrum as garage door openers could deliver fast Internet connectivity for the one-time cost of radio purchase, completely bypassing the telcos, their bottlenecks, and their charges.

Others in the wireless community, particularly those coming from more traditional and corporate-oriented areas of the industry, have maintained that this "solution" is in fact fraught with technical problems and not commercially viable (See, for example, *http://www.microtimes.com/debate.html*). Advocates like Gilder, however, point to Qualcomm (*http://www.qualcomm.com*) and other vendors as proof of technical superiority and commercial viability.

Even proponents of the technology recognize that there are still numerous problems to be solved, and in the interest of reality checking, we report on some torture-testing.

Last year, looking at wireless Internet access, we visited Metricom (*http://www.metricom.com*), whose Ricochet Internet service utilizes spread-spectrum technology in a license-free band to allow low-cost wireless access. For users lucky enough to live and work in the served area, this can be a godsend; however, while Metricom works night and day to install more repeaters and to improve service, performance varies a good deal according to geography and network infrastructure.

For a serious torture test in this issue, Shawn Jipp takes his ahead-of-its-time communicator from a few years ago, Sony's MagicLink, goes to heroic (and now, unneeded) lengths to connect it to a Ricochet, and reports mixed results—it's not well-suited to working on BART, for example. On the other hand, in areas saturated with repeaters, the technology performs really well—at the CSPA conference, PointCast (*http://www.pointcast.com*) executive Joseph Pistritto demoed his product on a Ricochet-equipped laptop, which, on the Stanford campus, was quite zippy.

Ricochet customers will soon have the option of using a faster and more compact radio than the current offering. Meanwhile, other companies (e.g. Breezecom, *http://www.breezecom.com*) are making other devices to take advantage of the unlicensed spectrum to deliver T-1 speeds to corporate and ISP clients, allowing them to bypass land-line installation charges and monthly telco costs.

For an arduous test, Dewayne Hendricks reports on installing wireless networks in Mongolia.

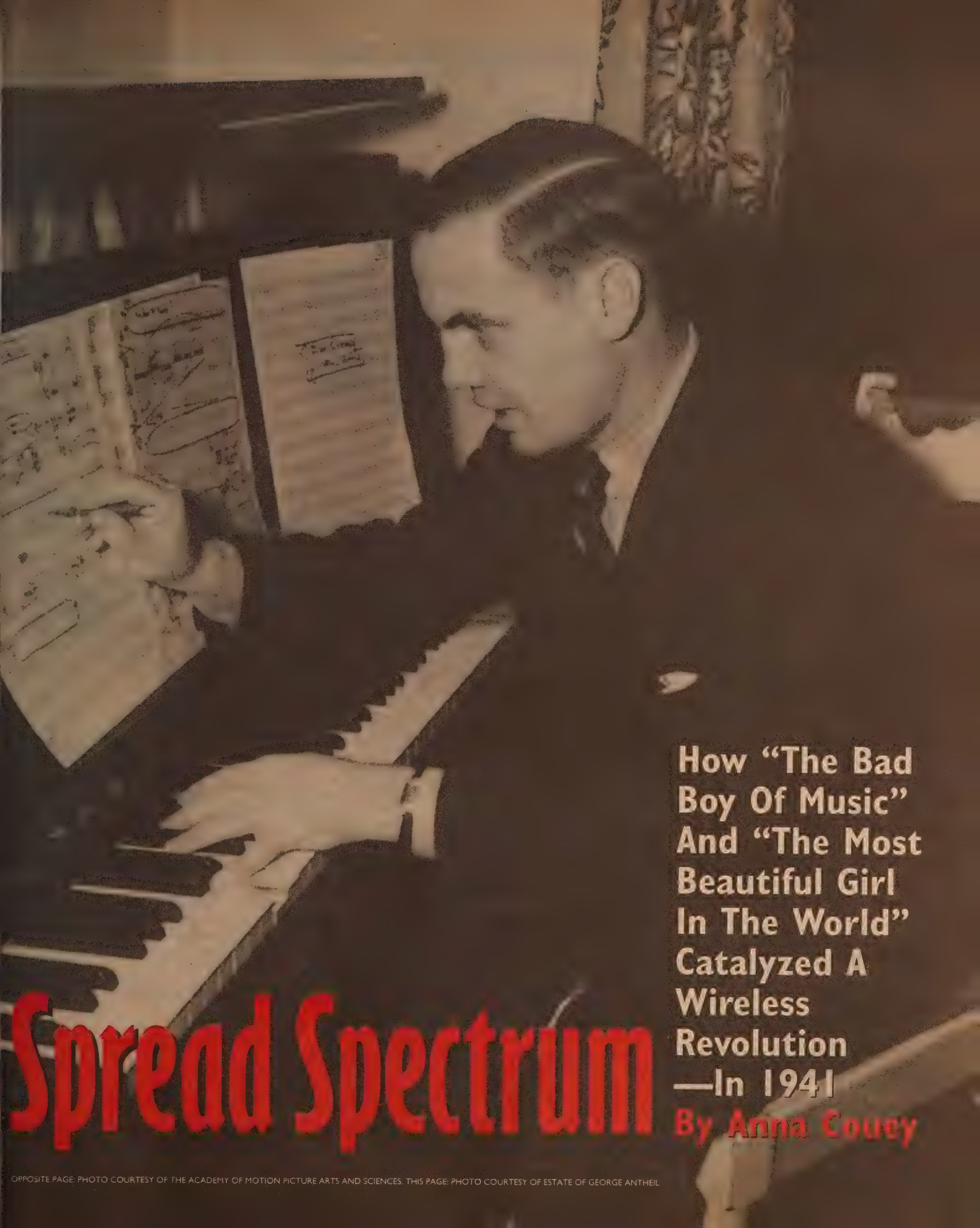
Spread spectrum is not the only promising technology for untethered communications, and many specialized solutions are likely to arrive from many providers.

The telcos are far from idle, offering a suite of voice and data options based on a variety of technologies at a variety of price points. Paralleling the development of the Internet is a growing range of services and options, from the fast and pricey to the more pedestrian and more affordable. Infrastructure and plumbing issues, to say nothing of technical problems, will remain significant well into the next decade—but there is a huge incentive to devise solutions.

As Gilder says in the same article: "With real wireless market share still well under 5% in telephony and under 1% in Internet access, the race has just begun."

—Mary Eisenhart

The Birth Of



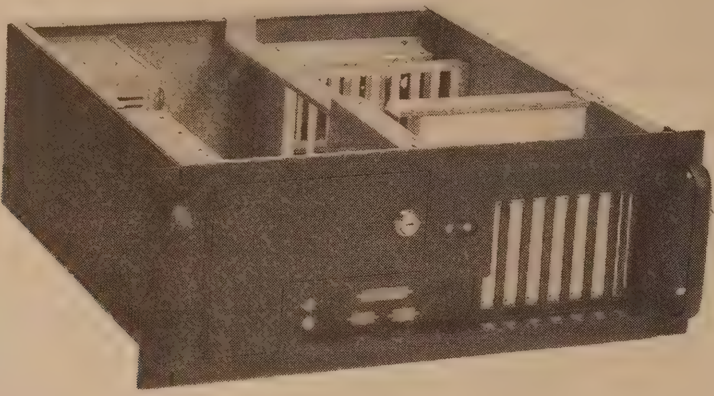
Spread Spectrum

How "The Bad Boy Of Music" And "The Most Beautiful Girl In The World" Catalyzed A Wireless Revolution —In 1941

By Anna Couey

OPPOSITE PAGE: PHOTO COURTESY OF THE ACADEMY OF MOTION PICTURE ARTS AND SCIENCES. THIS PAGE: PHOTO COURTESY OF ESTATE OF GEORGE ANTHEIL

ATX RACKMOUNT LEADER



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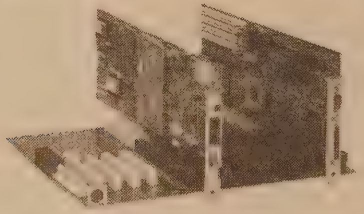

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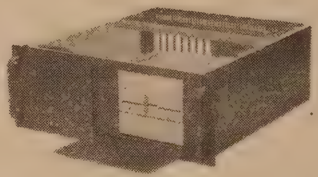


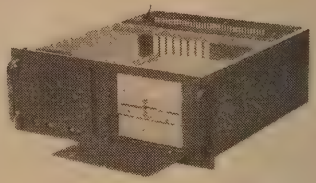
RC-4107ATX

Multimedia Server Application

Rear access slots

SIX DRIVE BAYS (3 exp., 3 int.)

Control Panel: LED (Power & HDD)
Switch (Reset)



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The Birth Of Spread Spectrum *continued...*

Today, spread spectrum holds the potential to revolutionize wireless communications, because it renders radio spectrum—a resource currently deemed so precious that only the largest of corporations can afford to buy it—plentiful enough for all of us.

PHOTO COURTESY OF ANTHONY LODER

> **"People assume perhaps she wasn't intelligent because she was so beautiful. But she really had a mind...she held her own with anybody," says Peter Antheil.**

Spread spectrum is a highly efficient way of using radio waves to communicate, because it enables multiple users to share radio frequencies at the same time, without interfering with each other. Up until now, each radio station, for example, has been allocated a specific frequency over which to broadcast their programs. Since there are only so many bands of frequency within the entire radio spectrum, frequency bands are carefully allocated by the FCC for particular uses—such as commercial broadcasts, military communications, police radios, ham radios, etc.

Currently the US government licenses radio frequencies to the highest corporate bidder. Spread spectrum stands the concept of spectrum scarcity on its head, and just might rearrange who has access to radio waves in the future. For now, spread-spectrum radios provide high-speed wireless access to the Internet, with absolutely no telephone fees.

However, like many technology inventions, spread spectrum was designed for an entirely different purpose. The story of its birth and evolution is an epic drama of legendary proportions: World War II, avant-garde music and Hollywood all had a role in its creation.

At the center of the story is a beautiful young woman, whose creativity and intelligence led her to revolutionize communications technology into the 21st century.

The Road To Hollywood

Today, Hedy Lamarr lives in quiet seclusion in Florida. During World War II, however, she was a glamorous Hollywood star, "the most beautiful girl in the world." Her real-life story is arguably more alluring, and certainly more heroic, than any role she played on the silver screen.

Born Hedwig Maria Eva Kiesler in Vienna, Austria, sometime between 1913 and 1915 (history is not definitive on this point), Lamarr came to Hollywood shortly before World War II at the invitation of Louis B. Mayer and Otto Preminger to work for MGM. She had already made a memorable impression on the big screen for her revealing performance in *Extase* (*Ecstasy*), a 1933 art film that shocked societal sensibilities of the time for its frank sensuality.

Behind the star image lies a complex person who defies stereotypes. Lamarr married six times and, besides being an actress, painted abstract works of art and designed inventions. "People assume perhaps she wasn't intelligent because she was so beautiful. But she really had a mind...she held her own with anybody," says Peter Antheil, who remembers her visiting his parents' home when he was a child.

In Hollywood, the beautiful actress found success, and the world at her feet. But she didn't forget that World War II was brewing in Europe, and she was determined to do something about it.

Technology And War

Lamarr had strong personal reasons to be against the war. She had recently escaped from her first husband, who was selling munitions to Hitler.

Fritz Mandl was one of Europe's largest armaments manufacturers. He had become the primary supplier of armaments to the Austrian army during World War I, when, it later turned out, he and Austria violated the Versailles Treaty by selling weapons to Hungary. Moreover, he appeared to be developing a reputation for selling "bombs and bullets and airplanes to Hitler and whoever else wanted to buy them," as Anthony Loder, Lamarr's son, describes it.

Lamarr and Mandl married in 1933. It was not a happy marriage, at least as far as Lamarr was concerned. Mandl was extremely possessive, and kept her "like a slave," she says, under the watchful eye of her maid. To the public, she was Mandl's showpiece, dazzling his clients and the cream of Austrian society. But Nazis were on the rise, and Lamarr had no use for them. She didn't just sit pretty.

Mandl was conducting research in weapons control systems. At the time, research was indicating that radio waves were better than wire for controlling weapons such as torpedoes. For one thing, it was hard to make a wire long enough (even ten miles was too short) to ensure that the communications channel between a commander and a torpedo would not break, leaving the torpedo to chart its own course. Radio waves solved the problem of needing a physical communication connection between commander and torpedo. But radio waves had a serious flaw: enemies could access the same radio wave and jam it.

As Mandl's wife, Lamarr was exposed to military technology ideas. By her own account, Mandl kept Lamarr at his side during his business meetings, a silent witness to technical discussions that foreshadowed World War II. Lamarr had no formal education in military technology, but she had a mind capable of understanding what she heard.

After four years of marriage to Mandl, Lamarr drugged her maid and left him forever. She made her way to London, where she came in contact with Louis B. Mayer of MGM, who arranged for her to come to the US. On the voyage across the Atlantic, Mayer gave her the name "Hedy Lamarr," in part inspired by the actress Barbara LaMar, and "...for the sea!," Lamarr's son, says.

Player Piano

Lamarr met George Antheil at a party in Hollywood, and they became friends.

"George was 5' 3" maybe, he was not very tall, but he was extremely charming—especially with women," says composer Charles Amirkhanian, who manages the George Antheil Archive.

Antheil had been at the forefront of experimental music in the 1920s, part of the first generation of artists that explored mechanical music as an expression of industrial society. "George was one of the first people to work with the player piano as a legitimate instrument for composed music," says Amirkhanian. Antheil's famous "Ballet Mecanique" was writ-

The Birth Of Spread Spectrum *continued...*

ten for twelve player pianos, an airplane propeller and a symphony.

Antheil was quite famous in Europe, and had done a lot of creative work there. In the early 1930s, he had received a Guggenheim fellowship to go to Europe. But when Hitler began to close the German opera houses that presented modern music, Antheil returned to the US. Not only was his own source of work threatened (these very same institutions were among those who commissioned his compositions), Antheil "was very angry about Hitler's influence on the arts in Europe. He actually had to leave Europe because of Hitler, or felt he did," says Amirkhanian.

Antheil also emphatically opposed the Nazis. His son Peter remembers, "My father wanted to go into the army, but he couldn't; he was too old. But he wanted to do anything he could to help the war effort. I remember that they felt very strongly about it, both Hedy and my father, about war, and having to defeat the enemy."

PHOTO COURTESY OF ANTHONY LODER

Mandl and Lamarr on horseback in the mid-1930s

In that context, Lamarr told Antheil about her idea for a Secret Communications System that could guide torpedoes to their target without being intercepted by the enemy, by sending messages between transmitter and receiver over multiple radio frequencies in a random pattern. The message would move so quickly across the radio waves that anyone tuning in to a particular frequency would only hear a blip, and would be unable to intercept the message.

The only problem was how to ensure that the transmitter and receiver would stay in synchronization as they moved through the frequencies. Lamarr thought Antheil could help solve the synchronization problem. As a result of his musical experiments, Antheil had a good deal of experience with sound synchronization.

> **In Hollywood, the beautiful actress found success, and the world at her feet. But she didn't forget that World War II was brewing in Europe, and she was determined to do something about it.**

He did indeed hit on the solution for the invention to function: paper rolls perforated with a pseudo-random pattern would delineate the frequency path. Two rolls with the same pattern would be installed in the transmitter and receiver. If the two rolls were started at the same time, and one stayed at the launch point while the other was launched with the torpedo, and "if you had good rotary stability in the motor driving the paper rolls, you'd maintain the synchronization right on down to where the torpedo hit the ship," explains Dr. Robert Price of Consulting in Electronics Systems. Just like the player piano rolls in "Ballet Mecanique;" in fact, the two inventors designed their system to use eighty-eight frequencies—exactly the number of keys on a piano.

Patriotism And Barriers

Lamarr and Antheil knew they had something that could help win the war. They sent their invention to the recently established National Inventors Council, and Antheil claimed that Charles Kettering himself, director of the Council and research director at General Motors, encouraged them to patent it. The two inventors worked with an MIT electrical engineer to iron out some technical kinks, and submitted their patent proposal in 1941. On August 11, 1942, Lamarr and Antheil were awarded US Patent Number 2,292,387 for the Secret Communications System.

Rather than develop the patent commercially, "they gave it away to the government for the war effort," says Peter Antheil. Despite the fact that they stood to gain financially by holding onto the patent—and Antheil in particular was always struggling financially—like many people in that time, they were both committed to helping to defeat the Nazis. "It was a totally different culture then. I can remember it even as a small child, and it was kind of a reflection of the way people felt in those days for George and Hedy to give the invention to the government to help win the war with...there was a tremendous feeling of patriotism," recalls the younger Antheil.

The Navy, however, refused to take the Secret Communication System seriously. Technologists questioned whether the paper rolls would hold without breaking, whether the rotary motor that synchronized the rolls would be accurate enough, and whether the paper rolls could be made small enough to fit inside a torpedo.

Despite Antheil's active lobbying and insistence that the US Navy needed the invention to compete with Germany's sophisticated military technology, the Secret Communications System was never used during World War II.

Antheil was convinced that the Navy's reticence was due to an anti-cultural bias: "In our patent Hedy and I attempted to better elucidate our mechanism by explaining that certain parts of it worked like the fundamental mechanism of a player piano. Here, undoubtedly, we made our mistake. The reverend and brass-headed gentlemen in Washington who examined our invention read no further than the words 'player piano.' 'My God,' I can see them saying, 'we shall put a player piano in a torpedo.'"

Not only was the invention rebuffed, but so were Lamarr's efforts to contribute her considerable technical abilities to the task of defeating Hitler. When she offered to come to Washington, D.C. and work at the National Inventors Council, she was told she'd be of greater service to the war effort by remaining in Hollywood and using her star status to raise war bonds. She did indeed raise $7 million for the war effort, but her intellectual talents remained untapped.

From Navy To Commerce

When the war ended, Lamarr and Antheil put the invention behind them. It was not to be implemented in Antheil's lifetime.

However, while seemingly inactive, the patent was not forgotten. Electronic technologies were beginning to develop, and in the 1950s, engineers from Sylvania Electronic Systems Division began to experiment with the ideas in the Secret Communication System patent, using digital components in place of the paper rolls. They developed an electronic spread-spectrum system that handled secure communications for the US during the Cuban Missile Crisis in 1962. By then, the Secret Communications System patent had expired.

continued on page 114

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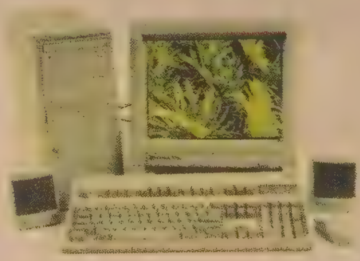

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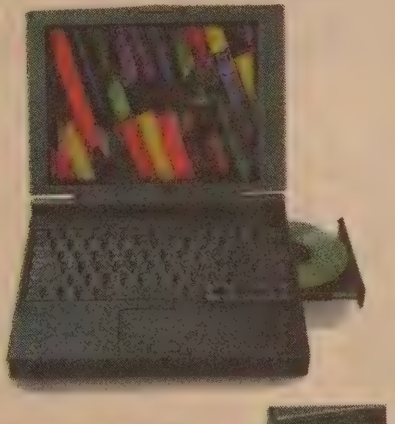

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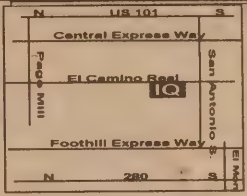

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The Birth Of Spread Spectrum

continued from page 108

It was in the early 1960s that the term "spread spectrum" began to be used. Today it refers to radio communications that employ cryptographic subsystems (like the pseudo-random patterns on the Secret Communications System's paper rolls), use a wide frequency spreading factor (much wider than typical voice telephone communications), and are not dependent on a particular type of tonality (such as a human voice) in the transmitting waveform.

"Hedy Lamarr and George Antheil were the first to satisfy all three ingredients," says Price. Their spread-spectrum technique is today called "frequency hopping" because the transmission jumps from frequency to frequency.

Initially, spread spectrum remained a military communications technology, and even today "the Defense Department of the United States has a huge investment in spread spectrum of a frequency-hopping type now, just like Hedy Lamarr's, which protects our assets all over the world," notes Price.

> "The reverend and brass-headed gentlemen in Washington who examined our invention read no further than the words 'player piano.' 'My God,' I can see them saying, 'we shall put a player piano in a torpedo.'"

In the mid-1980s, the US military declassified spread-spectrum technology, and the commercial sector began to develop it for consumer electronics. Today, it's an increasingly important component of mobile telephony. CDMA (Code Division Multiple Access) technology uses spread spectrum. Spread spectrum has proven highly useful in cellular telephones, because its inherent encryption guarantees better privacy for cellular phone users. The technology has also proven to be an extremely efficient method for using radio waves. Rather than requiring each transmission to use its own frequency, spread spectrum enables people to simultaneously communicate over the same bands of spectrum without appreciable interference. Thus, as more people buy cellular phones, the increasing demand for spectrum can be accommodated by sharing the same frequencies.

Spread Spectrum And The Internet

Spread spectrum's efficient use of available bandwidth also holds great potential for connecting small rural communities and other outlying areas to the Internet.

Phone companies much prefer to lay the wires for Internet connections in densely populated communities, where the economies of scale give them a large customer pool. While such a solution may make business sense for phone companies, it could have a devastating social impact by further isolating those outside the served areas from participation in the growing information economy. The problem is further exacerbated as national telephone systems around the world give way to privatization, for telecommunications companies, unlike governments, have no obligation to provide a baseline of access to all.

Once again, wireless technology appears to be more practical than wire by reducing the need to lay expensive cable across vast distances. Of the wireless technologies currently available, spread spectrum is affordable, and experiments are proving that it is effective. The Latvian Research Network (LATNET) has implemented a wireless Internet access network in Riga, the capital city of Latvia, that uses spread spectrum.

continued on page 190

Recognition At Last:

Hedy Lamarr & George Antheil Receive EFF Award

A MERE HALF CENTURY AFTER HEDY LAMARR AND GEORGE ANTHEIL broke through the conceptual impasse in remote weapons control and invented spread-spectrum technology, they were belatedly honored for their achievement.

The Electronic Frontier Foundation gave the two inventors a special award during its sixth annual awards ceremony at the seventh Computers, Freedom & Privacy Conference in March. Lamarr's son, Anthony Loder, received the award on the famed Hollywood actress' behalf, as she was unable to attend the ceremony. Charles Amirkhanian, who maintains the George Antheil Archive, received the award on behalf of the late composer.

"Ironically, this tool they developed to defend democracy half a century ago promises to extend democracy in the 21st century," notes Mike Godwin, staff counsel for the Electronic Frontier Foundation.

Spread spectrum is a wireless communications technology that utilizes radio waves to send communications from one person to another. Historically, radio waves have been considered to be a limited resource. The quantity of available radio waves is divided into bands of frequencies. Currently, the US government licenses the right to control a particular band of frequencies to the highest bidder—typically a very large corporation. A single radio station, for example, is allocated a particular frequency to broadcast its programs. With the advent of wireless consumer communications devices, such as cellular phones, demand for access to the airwaves has increased.

However, spread-spectrum technology works effectively over a range of frequencies heretofore considered unusable, thus opening up a whole new territory for wireless communications. At the same time, spread spectrum allows for the sharing of frequencies, so that it actually reduces the scarcity of radio waves to such an extent that the old system of treating bands of frequency as high-priced real estate is becoming obsolete.

Lamarr and Antheil gave their invention to the US government to help win World War II. Unimplemented until 1962, during the Cuban Missile Crisis, and classified as a military secret until the 1980s, spread spectrum and its glamorous origins have been obscure, known only to a few highly technical specialists. Lamarr and Antheil have never received any financial remuneration for their invention, even though today it is used in over forty commercial products.

The Electronic Frontier Foundation presents awards to "recognize individuals who have made significant and influential contributions to the development of computer-based communications or to the empowerment of individuals in using computers."

The Electronic Frontier Foundation received the award nomination for Lamarr and Antheil from Dave Hughes, who learned of their invention while conducting wireless research with a National Science Foundation grant. Hughes investigated the story and posted his findings on the WELL online conferencing system, where the press picked up the story. Numerous seconds to the nomination quickly followed Hughes' proposal.

On hearing of the award, Lamarr, ever quick-tongued, said, "it's about time!"

—Anna Couey

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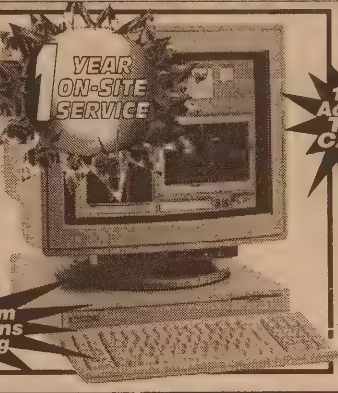

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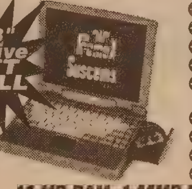

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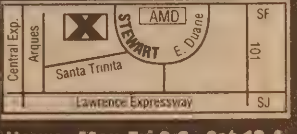

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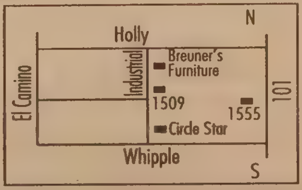

Magic Meets Ricochet

A Silicon Valley Adventure

By Shawn Jipp

Some time ago I bought a Sony Magic Link, a pocket-sized personal communicator using the Magic Cap operating system from General Magic. I believe that the Magic Cap PDA operating system was years ahead of its time, and much better than the one on the Newton. I can teach anyone, even completely computer-illiterate people, to use it within 30 minutes. It is very intuitive and practical.

It contained a fax/modem, but over time, as General Magic and its platform became increasingly beleaguered, communication services that supported it became pretty rare.

I had subscribed to the AT&T Personalink Service. This email-only service cost only $9.95 per month and allowed me toll-free access from anywhere inside of the US. Personalink was based on General Magic's Telescript, an intelligent network agent that can make life on a network easier for you. With Personalink, I could send stamps, animations, sounds, and songs, along with up to five seconds of digitized speech to other Personalink users. I could even send name cards to other Personalink subscribers and it would appear on the receiver's Magic Link with no need to decode or do anything special. Another cool and powerful feature allowed one to request a name search for other users on the Personalink network.

> **Here we were out in the parking lot with a laptop that was browsing the Web. I was impressed.**

The AT&T Personalink service was sort of a little Internet for Magic Link users. It was great, and fun while it lasted.

Unfortunately, AT&T could not afford to have a non-standard Internet-type service running in parallel with the real Internet. They gave us all a two-month warning about the demise of Personalink. They also gave the last month to us free.

All was not lost for the small but dedicated Magic Cap community. General Magic acquired the rights to Presto! Mail, which allowed users to connect their Magic Link to a normal Internet Service Provider (ISP) using a PPP connection. Along with Presto! Mail came Presto! Links. Presto! Links allowed one to browse Web sites. We had the first graphical Web browser running on a PDA type device.

But those of us with older Magic Link PIC-1000's unfortunately only had the built-in 2400 baud modem to go surfing with. The updated PIC-2000 which appeared in 1995 came with a 14.4 modem along with a nice-looking backlit screen, Magic Cap OS 1.5, and twice the memory.

And besides, we still needed a phone line.

Enter Ricochet

I first saw a Ricochet modem [see *http://www.microtimes.com/metricom.html*] at a meeting of BAMCUG (Bay Area Magic Cap Users Group), which I'd founded some months earlier.

Metricom, based in Los Gatos, provides a wireless modem service called Ricochet throughout most of the San Francisco Bay Area, Seattle, Washington D.C., Eugene and Corvallis. They also provide their service to ten college campuses and seven hotels located across the country. Ricochet consists of a digital packet-switching radio network which operates on 162 frequency-hopping channels in the 902-928 MHz range. A "Microcell" radio is placed approximately every 1/4 to 1/2 mile in the coverage area. There is a WAP (Wired Access Point) for about every 100 of these Microcell radios. The 100 Microcell radios are placed in a checkerboard pattern within about a 20 mile square radius for every WAP.

The Ricochet modem is a self-contained unit that weighs about 13 ounces and is similar in size to a large remote control device. The modem is powered by a Nickel Metal Hydride battery pack and is connected to a serial port, as with a conventional landline modem. The Ricochet modem communicates with the Microcell radios which then communicate with the WAP, which is connected to the Internet via a frame-relay T1.

The operating frequencies used by the Ricochet network are above-standard cellular phone frequencies and are basically the same ones that garage door openers use. The Ricochet has been designed to very cleverly "jump around" and use frequencies that are not currently being used. If it finds one in use, then it will switch to another one. The fact that it is not using standard cellular frequencies, but instead makes use of unlicensed spectrum, means that the costs for such a system can be much lower.

The 1-watt Microcell radios for the Ricochet service can be found throughout the Bay Area attached to either street lights or utility poles.

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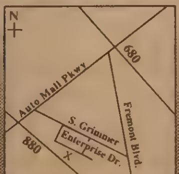

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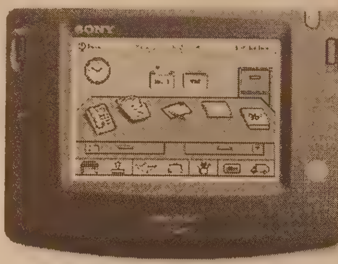
Magic Meets Ricochet *continued...*

Next time you are driving around, look a little higher than usual for a small white plastic "shoe box" with a short antenna protruding from it. Often the unit is mounted inverted with the antenna pointing down towards the ground. The cities rent space on these poles to Metricom. (A few cities have been uncooperative, and those are the cities where Metricom has no service). Not surprisingly most cities are glad to make a little extra money with their poles, and therefore most of the Bay Area is covered.



The Odyssey Begins...

I called Metricom and asked if someone could come out to our company to demonstrate their modem. Within a few days one of their salesmen brought his laptop and a modem. We took it deep into our building to the VAX computer room. I figured this would be a good test for its signal reception ability.

The salesman had difficulty getting a connection in the well-buried room, and lost it several times. The data transfer rate seemed really slow. After the demo, a friend and I walked him out to his car where he repeated the connection to the Internet once again. This time it had no problem establishing a connection, but still the speed was a bit disappointing.

But here we were out in the parking lot with a laptop that was browsing the Web. I was impressed.

The rep told us that if we both registered for their service that Metricom would waive the $45.00 sign-up fee. I decided to take the plunge. I called Metricom and placed an order for their modem and service. (At the time the cost was $29.95/month for the service and $10.00 to rent the modem; modem rental cost has since been increased to $12.50 per month.)

I was then told that they were currently out of stock on the special cable that would connect my Magic Link to their modem (another $30). They could only supply me with either a PC or Mac cable (free and included). I told them that I would wait for the special cable, but various technical problems kept delaying their arrival.

I found out that a person in our club named Mark Perriera had made his own cable, and had begun experimenting with hooking up an external modem to his Magic Link. He had subscribed to Ricochet before the manufacturing problems set in; he told me how the original Magic Link-to-Ricochet cable that had been included with his modem had been too short (very, very short) and how he had made his own for about $2.00 in parts along with a pre-existing Magic Exchange cable (Magic Exchange is a PC/Mac connectivity software package for the Magic Link or Envoy). By the time a batch of good cables arrived at Metricom, I had gotten the Ricochet modem and was using Mark's cable which worked like a charm. After using the Ricochet for awhile, I noticed that the battery life was only about an hour; the instruction manual had claimed battery life of "up to" 90 minutes. Metricom is addressing this problem by currently developing a smaller Ricochet modem that will have longer battery life yet weigh even less. I recently inquired when the new modem would be available and was told "perhaps before the end of 1997."

Power Tool Or Geek Toy?

So what did I do with my Ricochet and how did I like it?

- I used it while walking home from work to check my email and to browse the Web, but I found it to be too difficult to walk and surf at the same time.
- I took it to the park a few times, but something always seemed to distract me from enjoying this perfect merging of nature and technology. Maybe it was my allergies.
- I used it on my desk at work to receive email so that I wouldn't have to tie up the only phone line going into my office. This worked really well. I could surf or read my email while talking to customers on the land line.
- I once decided to impress everyone on my personal email mailing list, which consists of about seventy-five people from all over the world, by sending them a message from our shopping basket at Whole Foods in Cupertino. I sent out the email from deep within the store. The Magic Link/Ricochet combination was sitting in the child's seat while my kids hung onto the sides of the basket.

At least one person on my mailing list was totally impressed by this demonstration of cutting-edge technology from within the midst of organic foods!

- I tried using the Ricochet while riding on the BART train from Daly City to San Francisco. No luck.
- I tried using it in San Francisco. Very sporadic coverage. There are only certain areas that it will work at in the city. I tried it from inside Max's Diner across from Moscone Center. No luck.
- I tried using it while driving to San Francisco from Sunnyvale on Highway 101 at 65 mph. The data transfer falls way down at these high speeds, and often the modem will lose contact with one of the Microcell radios. I would not recommend driving over about 40 mph while surfing the Web. Please have someone else do the driving.
- The nerdiest/geekiest thing I ever did with the Magic Link/Ricochet combination was to walk around inside the CompUSA store in Santa Clara while being logged into the "Babylon 5" chat channel, typing to a "Babylon 5" enthusiast in England. People in the store looked at me strangely.
- At home I would sometimes connect the Ricochet to my Pentium PC and have it download really large files for hours and hours while we slept. The best data transfer rate that I could get was about 1.7k/second using Netscape. My internal 28.8 modem gets about 2.7k/second, but the nice thing was that I did not have to tie up our one and only phone line while accessing the Web.

I really liked this. It was like getting a new phone line. I really thought this was pretty cool and yet another reason to keep the Ricochet service forever until a friend commented to me that it would have been cheaper to have the phone company install another phone line for $80 than to pay the $39.95/month for the Ricochet.

Is It For You?

Would I recommend the Ricochet?

Yes and no. It depends on your use and geographical location. If, after reading this article, you feel that you have the perfect use and application for the Ricochet, and there are indeed many, then go for it. Just don't expect it to be as fast as your 28.8 or 33.6Kbps modems. Don't expect the battery to last over an hour (although it could). And don't expect perfect coverage in all areas.

Otherwise, have fun surfing, and with no wires attached! ■

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RESOURCES:

Ricochet
1-800-GO-WIRELESS
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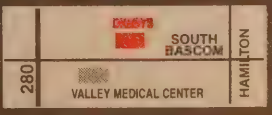

Wireless In Ulaan Bataar

Learning From A True-Life Mongolian Network Adventure

By Dewayne Hendricks

In Ulaan Baatar, Mongolia, severe weather conditions prevail, the wired telecommunications infrastructure is very poor, advanced telecommunications technology expertise is limited (although there is considerable local computer expertise), and US access to Mongolian scientific and research facilities is highly constrained by lack of normal Internet connections.

Last year, some of us went to Mongolia to integrate a series of data radios into a wireless network, and then field-test them. Our purpose was to build on and apply knowledge being gained from the "Wireless Field Test (WFT) Project for Education," funded by the National Science Foundation (NSF) and run by Dave Hughes of Old Colorado City Communications, in Colorado Springs, CO.

The Problem

The expedition's mission was an attempt to remedy the lack of a suitable wired telecommunications infrastructure in Mongolia, including across its capital city—a problem typical of thousands of cities in underdeveloped countries. "Suitable," in this case, means public or private circuits capable of carrying data with the reliability and bandwidths necessary for scientific research between institutions, increasingly equipped with advanced in-house computer and even local area networks.

As a result of this deficiency, the primary institutions in Mongolia, such as the Mongolian Technical University, the Mongolian Academy of Sciences and the many other educational facilities which reside in the capital city are inaccessible (via data link) to US scientific institutions, researchers and students.

What exists is a poor and obsolete government postal, telephone, and telegraph voice-telephone system, a holdover from when the Soviet Union controlled Mongolia. Efforts to use even late model error-correcting phone data-modems to link the computers in the various institutions is only partially successful, since the non-digital circuits are so old. It is difficult to maintain even a 14.4Kbps connection without the line dropping many times in an hour.

As a result of the first step to provide Internet access to Mongolia, NSF funded the establishment of a costly ($72K/yr) satellite Internet link. This 128K link, provided by Sprintlink, only reached one set of computers in a single building, in the central part of the city, by direct wiring. The PTT has neither the resources nor the expertise to provide even the lowest speed (56Kbps) wired circuits to connect the numerous other institutions.

The "last mile" problem of connecting this satellite link to the institutions (actually about one to ten kilometers from the satellite ground station), which must then distribute the signal to their own wired intranets, had so far defeated efforts to link it by local telephone facilities. In this respect, Mongolia is typical of scores of underdeveloped nations with a poor telephone infrastructure, too limited to adapt to modern requirements for institutional datalinks to and from other nations, especially the US. Wireless datalinks provide one possible general solution to this problem, not only in Mongolia, but in many other countries.

Challenges

A number of challenges made this a difficult project, as well as one from which valuable lessons and techniques were learned for application elsewhere:

- The weather is more severe in Ulaan Baatar than in the areas in Southern Colorado where our wireless field-test project has been implemented. High winds and average temperatures from -15° to -25°C for entire winter months will subject the radios, connectors, shielding materials, and antennas to extremes of cold and wind.

The question was whether or not economical commercial-grade radios and systems could handle the weather and give similar MTBF (mean time between failure) times to those systems operating in milder climates.

- Whether the electromagnetic environment from the equipment that exists in Mongolia today, some from systems developed and deployed by the Soviet Union in the past, in a different technological regulatory environment, will affect the spread-spectrum dataradios that we intended to deploy, which were developed in the US and operate in environments controlled by FCC rules.
- Could the wireless network be integrated into networks made up of a mish-mash of US and foreign computer and peripheral equipment, and would interoperability be a problem?
- Given the level of in-country expertise able to help install and maintain the wireless network, could local personnel be trained sufficiently in a short period of time to handle the network in the future, with only the assistance of remote expertise to call upon for help?

Groundwork

The Mongolian government had permitted a group of Russian-trained Mongolian engineers to form a private technology company, DataCom Co., Ltd, headed by Dr. Dangaasuren Enkhbat, using facilities at a technical center once occupied by Soviet engineers.

The NSF had turned to this company—with limited liquid assets, but in a suitable central facility in the capital—to provide the critical organizational link between the satellite-based Internet feed and in-country institutions. In return for being able to eventually provide Internet service to private companies in Mongolia, and being given control of the satellite groundstation, DataCom agreed to provide links to Mongolian public, scientific, educational, government, and library institutions for at least two years, at no cost. With initial funding from various sources, and with help from groups such as Sprint, PanAmSat, Comstream, NSF and the US ambassador to Mongolia at the time, Donald C. Johnson, DataCom became the first Internet Service Provider in Mongolia in December of 1995. (The top-level domain name for Mongolia is MN. DataCom maintains a Web site at *http://www.magicnet.mn/*).

Once the project was approved by NSF, our first task was to determine what would be required for the expedition and what we'd have to do once we arrived in Ulaan Baatar to deploy the wireless network. We made use of maps, videos and communications with the staff of DataCom, in order to determine exactly what types of radios would work in their environment, and what configurations and physical distributions of sites would be required for distribution of Internet services from the DataCom location. The plan was to install a basic wireless Metropolitan Area Network that would consist of eight sites: the DataCom site, and seven sites selected by DataCom. These were all universities, with the exception of the US Embassy.

Based upon our experience in the WFT project, we had made a preliminary decision to use unlicensed Part 15 dataradios developed and

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Basic System: MB w/CPU, 8MB RAM, IDE w/IO,1.44MB FD, Case w/power supply & KB.

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marketed in the US by a small Boulder, CO company called FreeWave Technologies, Inc. (*http://www.freewave.com/*). They make a spread-spectrum radio that can send data at 170Kbps over the air and interfaces to a computer via a serial data interface (RS-232) at 115.2 Kbps. The radio operates in the 902-928MHz part of the spectrum, one of three bands utilized by Part 15 devices in the US. These radios put out 1 watt of power; using various antenna configurations we have been able to obtain/send data with them distances of up to 60 miles. (For more information on the use of these sorts of unlicensed spread-spectrum radios, check out our WFT project Web site at *http://wireless.oldcolo.com/*).

We learned that the 902-928MHz band was not completely available for our use in Mongolia, since the commercial cellular telephone network there used GSM technology which operated in a portion of the band from 902-915 MHz. In order to use the FreeWave radios in Mongolia, we had to make two things happen.

We first got DataCom to obtain from the Mongolian government permission to operate the radios in the 915-928MHz part of the spectrum, avoiding the conflict with the GSM cellular network. We next got FreeWave to provide us with a special version of their radio which would operate in this smaller portion of the 902 MHz band. As it turns out, this was not difficult—they had already encountered the same problem when they first entered the Australian market, which uses GSM cellular in the same band.

In order to connect each site's radio to the local LAN we determined that we needed a low-cost Internet router that could be installed and maintained at each location. For the WFT project, we had already developed such a router based upon the widely available Linux operating system and a low-cost PC. We decided to use this approach in Mongolia, as we already had a great deal of experience with this router and an attached FreeWave radio. Aside from Linux, all a PC needed to function as a special purpose IP router was a high-speed serial card that would support an interface speed of 115.2Kbps and enough RAM to allow Linux to function properly (in this case we used 16MB).

Also important were the antennas and feedlines. It was clear that we needed an omni-directional antenna for the DataCom site, since it was the point-of-presence (POP) for all Internet services and each remote site would have to connect to it. For the remote sites, we would require a directional antenna that could focus all of the available energy from the radio on the POP.

Although the distances involved in the Ulaan Baatar network would be a good deal less than we had been used to in the US (average about 20 miles), we decided to use the same high-gain omni and directional antennas that had used here rather then taking the time to find lower-gain alternatives—it's better to have more antenna gain than you need than to get there with less and find out that you need more. We also decided to use the same low-loss coax feedline (LMR-400) to connect the radio to the antenna that we had been using in the WFT project.

Even with all the up-front analysis of each site's requirements, we still had no idea of the exact amount of feedline that we would require. As a result, we decided to take three times as much as we thought we'd need.

Finally, there was the issue of electrical power. In Mongolia, they use 220 VAC; we had to obtain the necessary power adapters and connectors to insure that the radios and routers could all operate on local AC power.

As it's common practice with an expedition of this sort to a remote part of the world, we made sure that we had spares for all of the key equipment, especially routers and radios. When it came to just how we were going to get all of the equipment to Mongolia, the NSF intervened and made arrangements with the US ambassador in Mongolia that allowed us to ship everything via diplomatic channels (the famous "diplomatic pouch"). Thus we were able to avoid the normal problems encountered using commercial shipping firms and dealing with customs procedures.

It turns out that spread-spectrum radios cannot be exported to countries such as Mongolia without a special export permit from the US government. Obtaining such a permit can take anywhere from three to six months. As we were trying to get the expedition completed before the harsh Mongolian winter started (December-March) we were fortunate in being able to bypass that requirement by shipping the radios the way that we did.

The downside in using the diplomatic channel for shipping is that once you put your shipment into the system, you only have a rough idea when it is going to arrive at its destination. Thus we had to use estimates on the time it took other items to arrive in Mongolia as the basis for determining just when the expedition team itself should arrive. As it turned out, we were lucky in that most of the equipment arrived before we arrived in Mongolia, with the exception of a few pieces that arrived after we had been in-country about a week.

Installation

A team consisting of Glenn Tenney (of Fantasia Systems, San Mateo) and myself left for Mongolia in October of last year. After we had arrived, made the initial visit to DataCom, and inventoried our equipment that had arrived (except for the few missing items), the first order of business was to survey all of the chosen sites in order to determine just what would be needed to deploy the equipment.

We were shocked to find that DataCom was surrounded by high-rise buildings that effectively blocked line-of-sight to all of the sites where installations were to have taken place. One of the key factors in getting this type of low-power radio to work properly is to have a clear line-of-sight path to any location that you wish to contact. Without major obstructions, it is possible to establish communications over fairly long distances; with obstructions it is usually not possible to go more than a few hundred feet. Given what we saw from the DataCom site, it looked like it was time to wrap things up and get on the way back home. However, we decided to make the best of a bad situation, attempt to proceed anyway, and see just what could be accomplished.

First, we installed the first radio and router at the DataCom site. In order to maximize the power output to the antenna from the radio, we mounted the radio on the roof of the building just a few feet from the antenna in a small equipment shed. This approach allowed us to use just a short coax feedline to the antenna and then a rather long serial-data cable to the router which was on the second floor of a four-story building. Since this location was the main hub for the wireless network, we used an omnidirectional antenna.

We next set up a mobile radio so that it could be powered by batteries and carried about in a car with one of the directional antennas. We decided that we wanted to travel around town and see if it was possible to receive the signal at any distance from the POP location. To our surprise, we were able to get a good signal at most of the sites where we were to have installed a radio—all without having line-of-sight to the POP. After some analysis, we were able to determine that even though Ulaan Baatar is populated with a large number of high-rise buildings, the materials used in their construction are such that they appear to be effectively transparent at the frequency of the radio emissions that we were using. This windfall allowed us to proceed with installation at each site as planned.

The most difficult part of the installation is the proper placement of the antenna and its connection to the radio. The major goal is to minimize the length of feedline used to connect the radio to the antenna—the basic rule being that the longer the feedline, the less power actually gets to the antenna, and hence the lower the sig-

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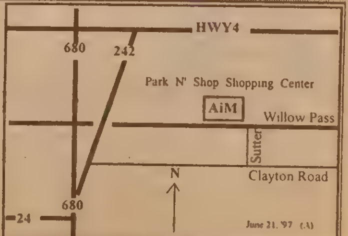

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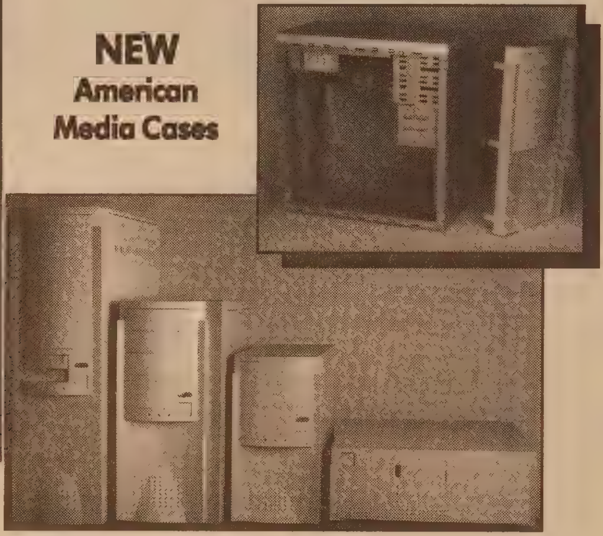

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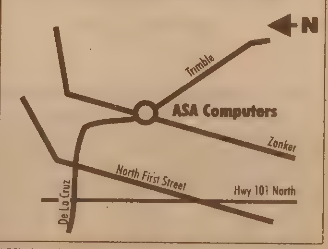

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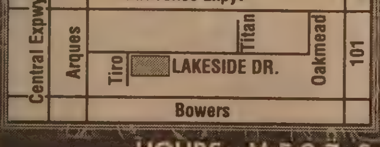

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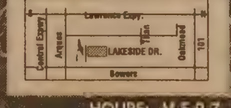

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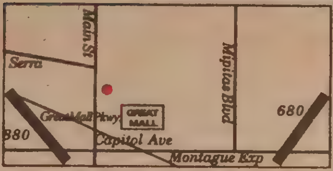

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TX-D7S(20") / T2-17TS	1620/858
EIZO FX-C5/FX-C6	697/780
FX-E7 / FX2-21	1620/2714
◆NEC	
M500 (15") / M700 (17")	367/735
XV15 Plus/JC1745	357/645
P750 (17" .25DP)	820
XE21	1534
◆MAG	
DJ530 / DJ700	312/550
DX15T / DX700T (.25DP)	335/619
DJ702 / DJ702E	563/535
Princeton EO 50 / EO70	277/468
Princeton Ultra 20	982
◆SONY	
100SX / 17SE2 T	354/827
100SF / 300SFT(20")	393/1553
200SF/200SX	738/645
20SE2T	1795
◆HITACHI	
CM500U/CM620U	312/525
CM611U(17")	644
CM800U(20")/CM-2011(20"	1360/1128
CM-701 / CM802U	1360/1679
◆VIEWSONIC	
E641 (14")	223
P815(21")/ E655	1552/306
15GS/15GA	339/373
17GA/ 17GS	590/554
17PS/17EA	673/565
G800 / G810	1,025/1340
GT770/GT800(20")	635/1127
PT770/PT 813	690/1448
◆NOKIA	
449E 15"/447XI	424/770
447L/445XI (21")	593/1699
◆IIYAMA	
MT-9017E/MF-8617E	658/579
◆MGC	
NI 14" Monitor 0.28	169
NI 15" .28 Digital Control	240
NI 17" Monitor 0.26	465
NI 1785 1600X1200 0.26	485

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Logitech Mouseman serial/Bus	23/36
Logitech Trackman	40
Logitech Marble Trackman	52

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Pentium® 200	*1752*
Pentium® 166	*1703*
AMD K6® 200MMX	*1878*
AMDK6® 166MMX	*1752*

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SVGA-512 / 1MB ISA	24/33
◆DIAMOND	
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Stealth Video 2001 2MB DR	72
Stealth 64 Video 2MB VR	114
Stealth 64 Video 4MB VR	170
Stealth 3-D 2mb/4mb EDO	80/102
Monster 3-D w/4mb Dram	180
3D 3000 2MB/4MB VR	138/180
◆SPIDER	
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Tarantula 64 MK II 2MB VR	65
Tarantula 64 MK II 4MB VR	95
Tarantula Lite 1MB DRAM	30
Tarantula 3-D 2MB EDO	70
Tarantula 3-D 4MB EDO	85
Tarantula 3-D/MTV 4MB	105
◆MATROX	
Millenium 2MB WR oem/ret	140/160
Millenium 4MBWRoem/ret	170/197
Mystique 2MBSG oem/ret	102/117
Mystique 4MB SG oem/ret	120/138
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Video Xpression 1MB/2MB	65/74
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◆QUANTUM	
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3.2 GB / 11ms (EIDE)	240
3.8 GB / 11ms (EIDE)	285
◆WESTERN DIGITAL	
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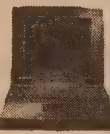

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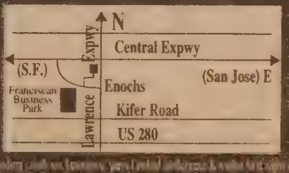

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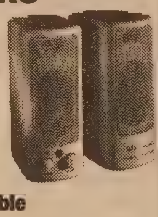

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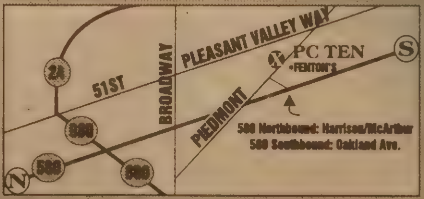

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BMUG • By David Morgenstern

Love-In At The MacFest

Multicolored Boxes, The Joys Of Being, And Other Tales Of Fervor And Zeal

A Note From The Editor:

With this column, we bid a fond farewell to David Morgenstern, who to no one's great surprise has finally decided that his other obligations are too pressing to allow him to continue. Particularly since David's been news editor at MacWEEK, *a status he's had for some time now, we've tended to regard each column he's filed as a triumph of dedication over exhaustion and to receive it with gratitude.*

As David notes, we are committed to continuing the BMUG column, and BMUG Director Anne Wrixon is in the process of selecting our new correspondent. We ask our readers' patience during the transition, and we thank David and BMUG for the value-added they've brought to us and our readers over the years. We wish David the best, and hope he manages to get some rest once in a while!

—Mary Eisenhart

Added to the usual selection of Mac tips and information, this month's column will include a report on the happenings at the recent BMUG MacFest, our annual event in Berkeley. Onward.

A Mac Feast At The Fest

Given all the negative press surrounding Apple over the past year, one might believe that this year's MacFest would be filled with a small band of somber campers. Instead it became a renewal for Mac-philes, a true love-fest.

A happy throng of about 7,000 made their way to the University of California campus for a good time with the Macintosh. There were several new product demonstrations and seminars.

"The Mac certainly doesn't look dead here," commented Lorca Hanns, Webmaster for the Franciscan Shops in San Francisco, and BMUG volunteer. He said the tremendous attendance evinced the famed loyalty of Mac users, especially BMUGers: "All these people turned up with minimal advertising [for the Fest], on a Saturday, and on the Berkeley campus, yet, where it's hard to find parking."

"Nowadays, people don't find graphical user interfaces unusual—Apple has completely succeeded in setting the general computing expectation of the public," said longtime BMUGer Bill Woodcock, network architect with Zocalo Engineering in Berkeley. "It's refreshing to come to MacFest where people don't take [GUI computing] for granted."

However, Woodcock admitted some Mac users and developers are a bit jaded about the Macintosh. But he was recently "blown away by the Mac's videoconferencing with CoolTalk. It really works great, even with a camera that costs under $200."

"I still have the capacity to be surprised by the Mac," Woodcock added. "You sometimes need to come back [to the Mac] and take a look with fresh eyes. The Mac still can have the great shock of ten years ago."

Apple's continuing financial woes were on people's minds.

"Deep down inside I may have some worries [about Apple], but here at BMUG I get great positive feedback," said Robert Lettieri, co-author of the Little QuickTime Page (*http://www.bmug.org/Services/qt/*). As a cross-platform Web designer, he was gaining greater acquaintance with the Wintel side: "I have to use Windows 95 and it really sucks." But Lettieri admitted to a bit of confusion, or at least ambivalence, since he found exploring a new operating system "exciting"—even one that he didn't really enjoy.

"There are sure a lot of people here for a 'little' show," commented Herb Dang, chief operating engineer with the San Francisco Public Utilities Commission. "The security guard is looking to close us down for overcapacity in the hall."

"Where I work it's a PC shop, and I have to justify any Mac purchase," Dang said. "The powers that be are scared by all the bad press about Apple. But I keep pointing out how the Mac is easy and Windows is not."

Many attendees brought their kids to MacFest. Some were BMUG babies in tie-dye; others were more startling—teenage children of longtime volunteers, now volunteering on their own! It's an odd feeling to say (like our parents before us), "I remember these kids when they were knee-high to the original Mac 128K."

"This is the reason I got into computers: fun," said Jim Fisher, a lawyer based in San Francisco. He had brought Sasha, his 5-year-old daughter (Sasha was quick to point out that she is 5 and three-quarters years old). "It's a great father-daughter afternoon."

MacFest Bigwigs

The event featured speeches by Ellen Hancock, Apple executive vice president of advanced technology, and Jean-Louis Gassée, CEO of Be Inc., the Menlo Park-based startup company with a forthcoming multimedia operating system that runs on recent PowerPC-based Macs.

Hancock gave the stock spiel about Apple's dual operating system strategy: the Mac OS and Rhapsody, the next-generation systemware based on the OpenStep software, which was part of the purchase of NeXT Software Inc., last December.

In Rhapsody, Mac OS applications will run in a so-called Blue Box compatibility layer, while new "native" programs will run in a Yellow Box. Initially, the Yellow and Blue Boxes will need a lot of RAM to run, so the technology will be aimed at high-end users.

However, Hancock said, to help education and mobile users, Apple will code the Yellow Box to run under 16MB of RAM. She expects that the Mac OS will be used for at least another couple of years. "It will take us a long time to get 20 million Mac users over to Rhapsody," she said.

I'd hazard a guess even with OpenStep's efficient memory handling, applications will want RAM above the minimum. Of course, even with today's Mac operating system (Version 7.6.1), more RAM is better; 32MB is a good place to start, and 64MB is very comfortable.

When asked about the user interface of Rhapsody, Hancock said there was a "raging debate" inside Apple over what elements from the Mac OS will be used in the forthcoming operating system. She said the company may be cautious rather than "getting clever with change for change's sake."

"I was impressed with Hancock's ability to answer questions from everybody, even from everyday users," said Gary Goodenough, a consultant based in San Francisco and a mainstay at BMUG West meetings. "She didn't talk down to anybody. I'm much more optimistic about Apple after hearing her."

In a separate demonstration, Gassée showed the capabilities of BeOS. Still in beta, the software will run on most PCI Macs; it has been licensed by several cloners.

Be is targeting its operating system at multimedia applications and Web servers. "The enterprise space is not for us," he said.

Gassée said it will be offered on the Net to users, as well as given away on a CD-ROM by the end of the year.

Gassée was trying to drum up support from BMUG developers. He said BeOS will appeal to independent "disenfranchised" programmers, without established products for Mac and Windows.

"If I'm a software developer with Mac and Windows products, I'm too busy [for Be]", Gassée said. "It's up to us to prove ourselves. Our developers will be people without an established business."

"BeOS is the ultimate demo operating system," said Bruce Linde, Web developer of Really Desperate Records and longtime member of the BMUG peanut gallery.

In a comic scene, Hancock high-fived Gassée on her way out of the hall after her talk. However, she did ask some of us to ask him some really hard questions.

At the end of MacFest, Tim Holmes, BMUGer and Apple systemware evangelist, demonstrated Mac OS 8, code-named Tempo. Slated for release this summer, this version includes many elements from Copland, the former next-generation operating system.

Some of the elements were major, such as Setup Assistants that interview users to set controls, and a new Help menu. Holmes said that testing revealed that users didn't really see the question-marked icon on the menu bar. Other features were just fun, such as the new HTML color picker that looks like crayons.

"The big thing is the new Finder: it's amazing," said Fernando Lozano, systems consultant with Deloitte & Touche Consulting Group LLP office in Walnut Creek. "I've been spoiled by UNIX [for powerful features], but the Mac user interface is truly elegant."

"In System 8, Joe average user will see performance increases, multithreaded Finder, and a cooler interface for doing everyday things," Lozano added. "There's no doubt that day in and day out the Mac is easier [to use] than any Windows box."

And from the look at Tempo, the Mac will be even more easy to use.

Bytes And Pieces

•Most users feel that the latest version of the operating system must be the best for their Mac. However, that may not always be the case.

Nowadays, there's a separate schedule between the systemware teams and the groups that qualify Mac hardware, so there can be a lag time between the time that a new model is released and then supported by the operating system. There are quarterly updates to bring things in sync.

For example, the Power Mac 4400, 6500, 8600, 9600 models are not supported by plain Mac OS 7.6. They shipped with System 7.5.5 and an enabler. However, they all work fine with the 7.6.1 update, released in April.

When asked about the user interface of Rhapsody, Ellen Hancock said there was a "raging debate" inside Apple over what elements from the Mac OS will be used in the forthcoming operating system.

So be very careful when installing the "latest and greatest," or you could do more harm than good. If you had put Mac OS 7.6 (the shrinkwrapped CD-ROM version) on one of the machines above, then it wouldn't work. Ouch! And if you didn't have the previous system to reinstall ... not very good.

•Many people are interested in Apple's eMate 300, the green, portable clamshell machine, based on the Newton operating system. Until recently, the sturdy unit was offered only to schools, but the company now lets individual students and faculty buy them. Higher-education users should call the Campus Direct Individual Purchase Program at 1-800-877-4433 and K-12 educators are served though the Apple Educator Advantage Home Computer Purchase Program at 1-800-959-2775.

•Kensington Microware Ltd. recently released SmartSocket Adapter, a new line of surge protectors that are very easy to use.

The best feature of the devices is the spacing of the sockets—far enough apart to hold six power adapters. Most surge protectors are designed for regular three-prong power plugs, and an adapter or two can cut out half the slots.

In addition, each socket has a colored plastic ring around it. Users can put similarly colored tags on the cords, so that one can quickly know which plug goes with what cord. No more following the cord back to the power strip, through the usual tangle behind the machine.

There are three models, each with a different joule rating. The basic, standard and premium versions cost $29.99, $39.99 and $49.99, respectively.

Shareware Spotlight

Tiger Technologies of Oakland recently released Window Monkey, a new shareware utility. The $20 control panel lets you put colors, patterns or an image in the background of a Finder window.

This is very useful feature if you frequently keep several windows open on the desktop, such as folders of aliases or documents. Or you can assign a pattern or color to the windows of an external hard drive or Zip disk. It's then easy to spot them in what's often a blizzard of other application or Finder windows.

In addition, Window Monkey throws an icon on the Menu Bar that lets you switch between currently running applications, other programs that you can set, and recently visited folders. When a file is saved or opened, the utility puts an icon that also lists folders.

Tiger is at *http://www.tigertech.com* .

Afterwards

I've been blessed to write this column since 1989; however, the increasing demands on my time from my workaday job, as well as my family, move me to pass the torch to another writer. At press time, BMUG Director Ann Wrixon was running down my replacement.

It has been a great privilege to write under the BMUG banner and I thank many friends for great support, especially the editors at *MicroTimes* and BMUGers around the world. Long live the Mac and BMUG! ■

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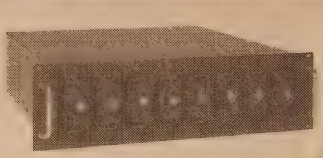

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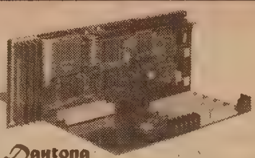

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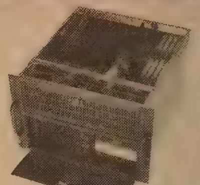

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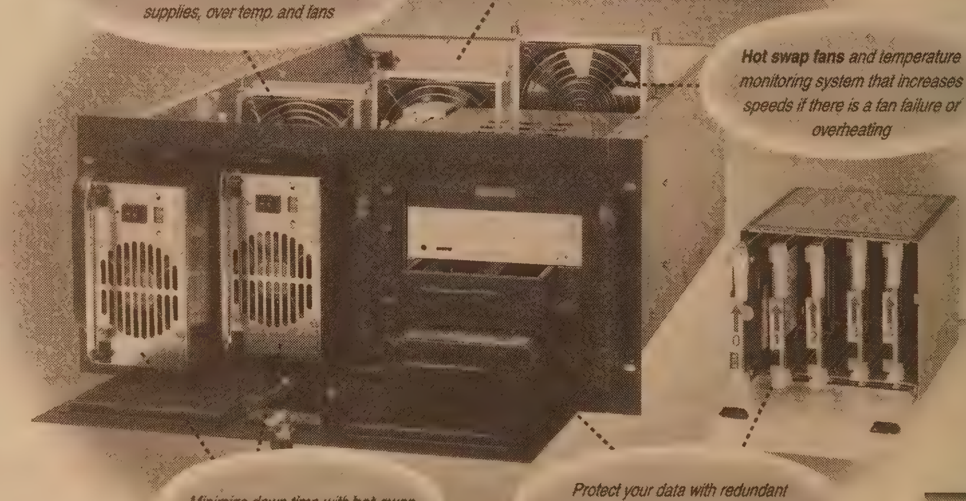

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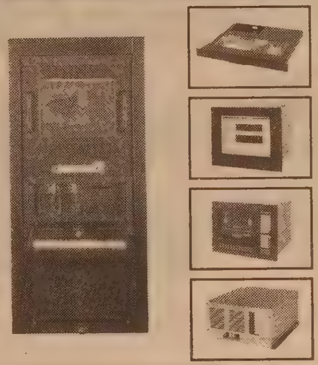

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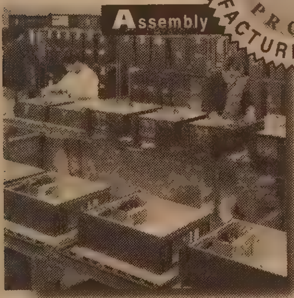

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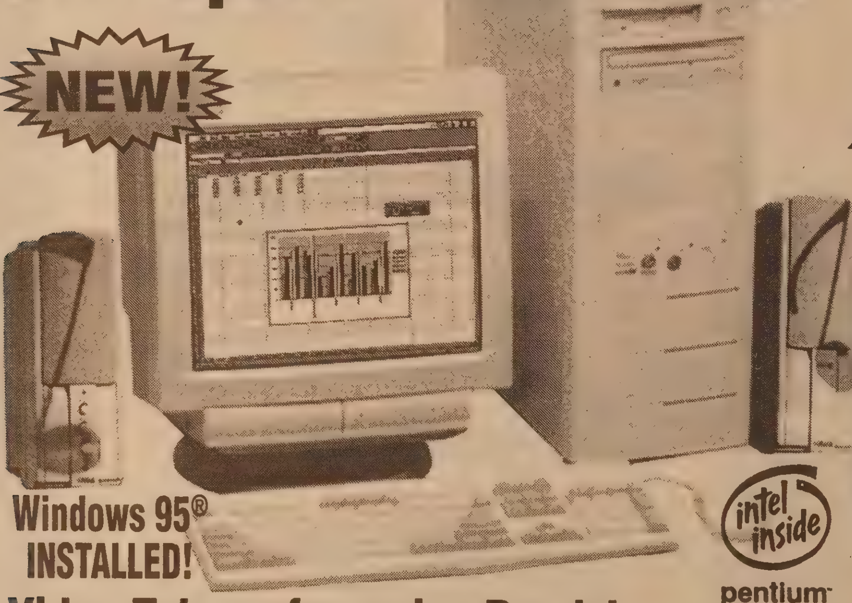

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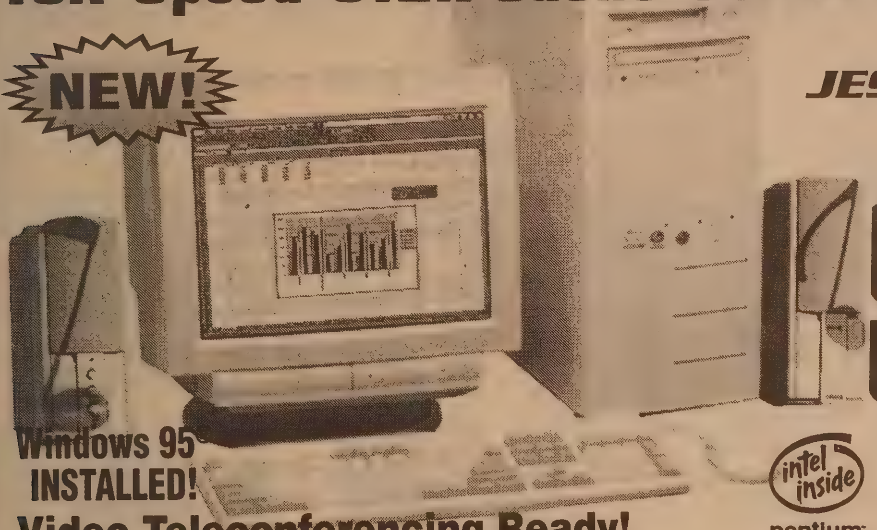

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- **Microsoft** Windows 95 Software
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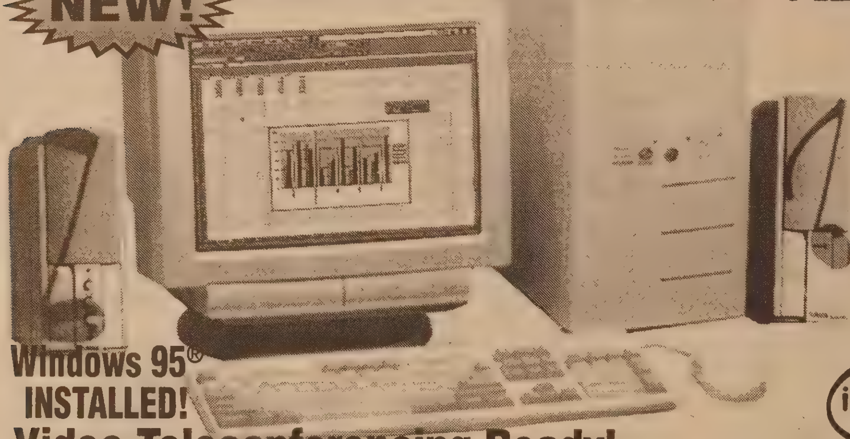

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  Monitor not included

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PCI WITH 256K PIPELINE BURST CACHE

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- 3 ISA & 3 PCI slots
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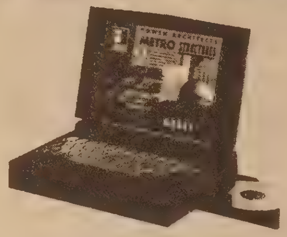

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- 6X, Integrated CD
- 64K Colors

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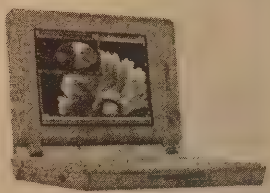

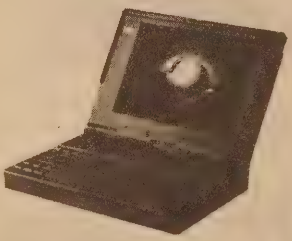

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- 1.35 GB Removable
- 16 MB
- 11.3" Active Matrix Color
- 2 stacked PC Card Slots
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730CDT Notebook

- 150 Mhz Pentium
- 2.02 GB Removable
- 16 MB
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- 10X, Integrated CD
- 16 Million Colors @800x6005

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- 120 Mhz Pentium
- 1.08 GB
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- 7200 RPM

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- 3 yr. warr.

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$179⁹⁵

FAST ATA 2

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- 11ms
- 128K Cache
- 5400 RPM
- Enhanced IDE
- 3 yr. WARR.

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- 128K cache
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FAST ATA 2

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- 128K cache
- 4500RPM
- Fast ATA-2

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FAST ATA 2

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- Enhanced IDE

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- 11ms
- 128K cache
- Enhanced IDE
- 3 year warranty

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- 12ms
- 128K cache
- Enhanced IDE

$219⁹⁵

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3.1GB IDE 3.5"X1" HARD DRIVE
- AC33100
- 12ms
- 128K cache
- 5200RPM
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Quantum™
3.8GB IDE 3.5"X1" HARD DRIVE
- QM33840TMA
- 10.5ms
- 128K Cache
- 4500 RPM
- Fast ATA-2

$299⁹⁵

NEW!

FAST ATA 2

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CONTROLLER & LAN CARDS

Low Price Guarantee!*

adaptec
Cogent PCI Combo LAN CARD
ANA 6901C

NEW!

- .132MBytes/sec(33MHz) burst data rate across the PCI Bus
- Small form factor design fits in virtually all PCI systems
- Predictive Pipelining™ for greater throughput Lower CPU utilization in Netware environment
- Full duplex ethernet(FDE) capacity
- Self configured Design for Plug & Go operation
- Combo versions offer RJ-45,BNC, & AUL Connectors for UNI Cable connectivity

$89.95 Combo

NCA's *High Quality*
Ethernet Combo ISA Adapter
E2000C

NEW!

- UMC Chipset
- 16-Bit ISA Bus interface
- 10 Base T & BNC connectors
- Boot ROM socket
- Auto detect for 8/16-bit bus
- NE2000 compatible
- Jumperless
- Runs on Windows 3.11 & Win 95
- 5 year Warranty

$19.95

3Com
Ethernet Combo ISA Adapter
3C509-Combo

NEW!

Plug & Play

- RJ-45, BNC and AUI connector for use in coax or 10Base-T networks
- Etherdisk diskette with Autolink software, drivers, and Diagnostics

$129.95

yes NetWare Tested and Approved

3Com
Fast Ethernet 10/100 PCI Adapter
Fast Etherlink XL-3C905TX

NEW!

Plug & Play

- RJ-45, catergory 5 UTP
- Compatible w/8023u fast ethernet standard
- Plug & Play ethernet or fast ethernet installation

$109.95

yes NetWare Tested and Approved

gsi™
16-Bit ISA-IDE Floppy & 250 Tape Controllers Card
GSI 21

- Support 2 IDE hard drives of any capacity up to 8.4GB
- Easy installation as on-board Flash BIOS auto installs IDE hard drives
- Flash BIOS accelerates IDE data transfer rates up to 95%
- Supports 4 floppy drives incl industry standard

ENHANCED IDE

$49.95

FAST-ATA-2

gsi™
32-Bit VESA Extender For GSI-ISA Controllers
GSI 1645-V1

NEW!

- Supports PIO Mode3 (11MB/sec) and Mode4 (16.7MB/sec) hard drives
- No need to reformat hard drive
- Compatible with all major operating software
- Allows mixing of old and new hard drives
- Compatible with EIDE & Fast ATA-2 drives
- Requires GSI 16-Bit ISA controller (which may need FREE BIOS update)

$79.95

FAST-ATA-2

gsi™
16-Bit Dual Channel EIDE Adapter
GSI Model 2C

NEW!

- Supports 4 EIDE drives (Above 528MB support)
- Co-resides with other disk controller boards
- Upgradeable to 32-Bit using GSI VESA Extenders
- On-board Flash BIOS means no driver required

ENHANCED IDE

$49.95

FAST-ATA-2

SMC
10Mbps Ethernet EZ ISA Network Card
Model SMC 8416T

Plug & Play

- .Ethernet 10Base-T Network card for ISA computers with one RJ-45 connector
- SMC's Simutasking for superior performance
- Support for all popular network environments

$94.95

ENHANCED IDE

Specom
High Speed Multiport Controller Card
Quick Path Flexport 22EX
16C650

NEW!

- 2(16C650) serial ports with 32 byte FIFO
- 2(EPP/ECP) parallel ports
- Single card solution
- Multiple addresses
- 10 IRQ for each serial, 8 IRQ each parallel port
- Toll free hotline for tech support

$109.95

adaptec
32-Bit VL-To-Fast SCSI & VL-To-EIDE Host Adapter
Total Advantage VL/AVA-2825

- Connect up to 7 SCSI devices
- Up to 2 standard or EIDE devices
- Up to 2 standard and 1 floppy tape drive
- Adaptec EZ-SCSI Lite software
- Up to 5MB/sec. synchronous on the SCSI bus
- Advanced SCSI programming interface compliant, disconnect/reconnect, synchronous data transfer

ENHANCED IDE

$124.95

adaptec
16-Bit ISA-To-Fast SCSI-II Controller
AHA-1522B plus

- Connect up to 7 SCSI devices
- Adaptec EZ-SCSI Lite software with 32-Bit applications for Windows 95 & Windows NT
- Connect SCSI-II hard drives, CD-Roms, Removable disks, scanners & other peripherals

$135.95

adaptec
32-Bit PCI to SCSI-II Controller
AHA-2920

- Connect up to 7 SCSI devices
- 10MB/s fast synchronous SCSI-II burst transfer rate on the SCSI Bus
- Adaptec EZ-SCSI Lite software with 32-Bit applications for Windows 95 & Windows NT
- Plug & Play Support for hard disk, CD-Roms, Removable disks,scanners, tape, Zip, Mo, DAT & other SCSI devices
- Programmable I/O(PIO) data transfer Compliance with 133MB/s PCI local bus specification

$145.95

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TAPE BACKUPS & REMOVEABLES

Low Price Guarantee!*

HEWLETT PACKARD

2X6 Recordable Internal SCSI-II CD Drive & Software

SureStore 6020i
- Internal 6X read 2X write
- 650MB Capacity
- Blank CDR disc included
- Includes recording software

$479^95

NEW!

YAMAHA

4X6 Recordable Internal SCSI-II CD Drive & Software

4X write & 6X Read!
- 6X read/4X write
- 2MB internal cache
- Includes recording software

$799^95

NEW!

Seagate

8.0GB SCSI Internal Tape Backup Drive

Tape.Store8000 NEW!
- Up to 8GB compressed
- Up to 60MB per minute /compressed transfer rate
- Connects to your SCSI controller
- Includes Backup Exec software

$379^95

iomega.

100MB IOMEGA ZIP Drive

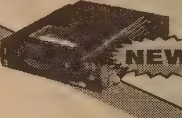
UNLIMITED PORTABLE STORAGE ON A 3.5" DISK

External Parallel Port or SCSI
- Unlimited Capacity Uses 100MB disks
- Fast -use it like your hard drive 29 millisecond seek time
- Up to 20MB per minute transfer rate

$149^95

100MB ZIP Cartidges....$19^95

NEW!



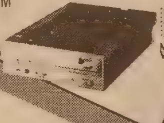
JVC

2X4 Recordable Internal SCSI-II CD Drive & Software

XR-W2010 *For PC or MAC*

While Supplies Last
- 1MB internal cache
- Write speed: 2x
- Read speed: 4x
- Includes Gear™ CD recording software
- FREE blank CD-R disk
- OEM

$299^95



COLORADO MEMORY SYSTEMS

3.2GB Internal Tape Backup System

T-3000 NEW!
- Up to 3.2GB capacity using Data compression
- Up to 19MB/min backup
- Includes powerful easy to use software
- Includes Windows 95 drivers

$189^95

INCLUDES FREE TR-3 Tape!(A $45 Value)

NOMAI™

540MB Syquest Compatible Removeable Drive

External SCSI or Parallel Port
- Up to 5.3/sec transfer rate
- 512K Cache
- 10ms average seek time
- Compatible with syquest 270MB cartridges

NEW!

$209^95*

After Mfg $50 Mail-in Rebate

iomega.

1.0GB External SCSI Removable

JAZ Drive WOW!
- Unlimited Capacity Uses 1.0GB or 540MB Jaz disks
- 256K Cache
- Up to 10MB/ per sec transfer rate

$419^95

1.0GB Jaz Cartidges....$99

PC or MAC

SyQuest

230MB Parallel Port Removable Drive

EZ-Flyer **While Supplies Last**

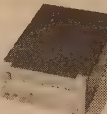
- 13.5 AccessTime
- Unlimited Storage
- Reads/Writes 230 & 135 cartridges

$288^95

HEWLETT PACKARD

2.0GB SCSI-2, 4mm,3.5" Internal DAT TAPE Drive

C1534A



- 2GB of Data on a single cartridge
- Avg. 50secFind File(Fast search)
- 183kb/sec transfer rate
- Uses 60 & 90 meter cartridge
- Compliant with all DOS DAT drives

$549^95

HEWLETT PACKARD

4.0GB SCSI-2, 4mm, 3.5" Internal DAT TAPE Drive

C1536A

- 4GB of Data on a single cartridge
- Avg. 50secFind File(Fast search)
- 366kb/sec transfer rate
- Uses 60 & 90 meter cartridge
- Compliant with all DOS DAT drives

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MITSUMI

High Quality

Floppy Drive

WOW!

1.44MB 3.5"

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CD-ROM DRIVES & SOUND CARDS

Low Price Guarantee!*

LITEON

20-Speed Internal IDE CD-Rom

20XMAX

NEW!

- .3000kb/sec data transfer
- 110ms access time
- 256K Cache
- Enhanced IDE

$109⁹⁵

WOW!

Retail Package

ENHANCED IDE

HITACHI®

16-Speed Internal IDE CD-Rom

CDR-8130

NEW!

- .2400kb/sec data transfer
- 150ms access time
- 256K Cache
- Enhanced IDE
- OE M

$119⁹⁵

ENHANCED IDE

TOSHIBA

12-Speed Internal IDE CD-Rom

5702B

NEW!

- .1800kb/sec data transfer
- 115ms access time
- 256K Cache
- Enhanced IDE
- OE M

MICROSOFT. WINDOWS.

$95⁹⁵

ENHANCED IDE

BTC

12-Speed Internal IDE CD-Rom

BCD-12X

WOW!

- .1800kb/sec data transfer
- 120ms access time
- 128K Cache
- Enhanced IDE

$79⁹⁵

Retail Package

MICROSOFT. WINDOWS.

ENHANCED IDE

TEAC

16-Speed SCSI-II Internal CD-Rom

CD-516S

NEW!

- .2400kb/sec data transfer
- 160ms access time
- 512K Cache
- Enhanced IDE
- OE M

$159⁹⁵

External for PC or MAC....$259⁹⁵

TOSHIBA

15-Speed SCSI-II Internal CD-Rom

XM-3801

NEW!

- .2250kb/sec data transfer
- 99(ms access time
- 256K Cache
- Enhanced IDE
- OE M

$189⁹⁵

External for PC or MAC....$289⁹⁵

CYBERDRIVE

12-Speed IDE Internal CD-Rom

120D

NEW!

- .1800kb/sec data transfer
- 150ms access time

$79⁹⁵

Retail Package

MICROSOFT. WINDOWS.

ENHANCED IDE

BTC WOW!

16-Speed IDE Internal CD-Rom

BCD-16X PLUG & PLAY

- 2380kb/sec data transfer
- 95ms access time
- 128K Cache
- Enhanced IDE

$89⁹⁵

Retail Package

MICROSOFT. WINDOWS.

ENHANCED IDE

BTC WOW!

16-Bit Wavetable Plug & Play Sound Card

- Real 16-BIT stereo
- Up to 44.1KHz Sampling
- 32-note polyphoney
- Audio drive VLSI chipset
- IDE interface
- Full duplex support

$45⁹⁵

Retail Package

CREATIVE
CREATIVE LABS, INC

16-Bit 32-Voice Wavetable Sound Card

Sound Blaster 32 PnP

- 32-note Polyphoney
- Wavetable Sythesis
- 16-Bit CD quality recording and playback
- IDE interface for CD-Rom drives
- Upgradeable to support Soundfonts
- Windows 95 Plug & Play

$109⁹⁵

CREATIVE
CREATIVE LABS, INC

64 Voice Advanced WaveEffect Sound Card

Sound Blaster AWE 64

- High performance low noise, advanced wavetable, 16-Bit CD quality Record & Play back
- **512K onboard RAM**
- Professional Sound Editing & sequencing software
- SoundBlaster INTERNET™ Audio• Sound
- 100% SB, SB16 & SB AWE32™ compatible

$179⁹⁵

Retail Package

YAMAHA WOW!

18-Bit Wavetable Sound Card With 4MB VoiceRom

Waveforce SW60XG

- For the PC gamer or musician
- **Wavetable, 32 notes, 16 parts**
- 4MB Voice ROM 676 Voices, 21drum kits compatible with General MIDI
- 11 types reverb & chorus, 42 types of variation

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15" 1280X1024 SVGA Color Monitor
M500
Built-in Speakers
NEW!
- .25dp
- Chromaclear™CRT
- 1280X1024
- Plug & Play
- Energy Star Compliant
- Mac Compatible

$389.95

NEC
17"1280X1024 SVGA Color Monitor
XV17+
- 60Hz refresh rate
- 1280X1024,.28 DPI
- Plug and Play
- PC and Mac Compatible
- Chromaclear CRT

$729.95

INTEGRATED MICRO SOLUTIONS
128-Bit Video Accelerator Card
2MB VRAM
TWINTURBO 128 P
NEW!
- 35 million pixel/sec line draw rate
- up to 16.7 million colors
- Realtime playback with hardware scaling
- Full screen true color video playback
- 5 year warranty

MICROSOFT. WINDOWS.

$189.95

DIAMOND
64-BIT 3D WOW? Graphic Accelerator
DIAMOND FIRE GL 1000
NEW!
- Fast SGRAM memory
- Dual Processor architecture
- 3DLabs GLINT Delta and Permedia Accelerator
- 220 MHz Ramdac
- Upgradeable to 8MB

MICROSOFT. WINDOWS.

$299.95

FULL LINE OF NAME BRAND COLOR VIDEO MONITORS AVAILABLE

SONY
17" 1280X1024 SVGA Color Monitor
200SX
NEW!
- .25dp
- Trinitron tube
- 1280X1024
- 60Hz
- Plug & Play
- Mac & PC Compatible
- 3 year warranty

$699.95

ViewSonic®
21" 1600X1200 Color Monitor
P815
NEW!
- .25dp
- 1600X1200
- 76Hz
- Plug & Play
- Mac & PC Compatible

$1759.95

ATI TECHNOLOGIES INC.
64-Bit 3D Video Accelerator w/TV Output
3D ProTurbo PC2TV
NEW!
- ATI 3D RAGE II graphics accelerator
- Up to 16.7 million colors
- High resolution 1600x1200 graphics at 75Hz
- High quality TV-out display
- Refresh rates upto 200Hz
- Upgradeable to 8MB

PCI
4MB
SGRAM

$185.95

ATI TECHNOLOGIES INC.
64-Bit 3D Video Accelerator w/TV Output
3D Xpression+PC2TV
NEW!
- ATI Rage II™ Video Graphics Accelerator
- Razor sharp graphics up to 16.7 million colors
- 64-bit acceleration for 2D Apps.
- TV with highly detailed 6,500 color graphics

PCI
4MB
DRAM

$159.95

FULL LINE OF NAME BRAND VIDEO GRAPHICS ACCELERATORS AVAILABLE

OptiQuest by Viewsonic
15" 1280X1024 Color Monitor
Q53
NEW!
- .28mm dp
- 1280X1024
- Plug and Play
- On screen Programming
- MPR-II compliant

$299.95

PRINCETON BY MAG
17" 1280X1024 Digital Color Monitor
E070
- .28mm dp
- Non-interlaced
- Up to 1280X1024
- Digital controls
- Plug & Play ready

$529.95

matrox
3D, Entertainment & Multimedia Accelerator
Mystique
- 64-bit PCI graphics accelerator
- **2MB SGRAM** (upgradeable to 8MB)
- Bundled with: Mech Warrior 2, Destruction Derby 2 & Scorched Planet

4MB PCI - $124.95*

$94.95*

Rebate Expires 6/30/97

matrox
Professional 3D, Graphics & Video Accelerator
Millennium
- 64-bit PCI graphics accelerator
- **2MB WRAM** (upgradeable to 8MB)
- Bundled with: color calibration software, 3D web browser, 3D/FX & Nascar® Racing

4MB PCI - $219.95

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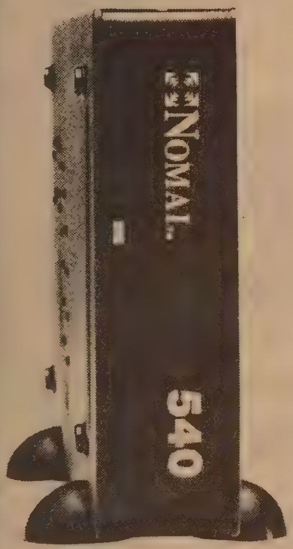
HIGH QUALITY PRODUCTS

Low Price Guarantee!*

NOMAI™

540MB 3.5" Syquest Compatible Removeable Drive



NEW!

Up to 5.3MB/sec. transfer rate!

Compare the Nomai 540 to other removeable storage options and you will chose Nomai. This fast, light-weight, portable drive accepts both Nomai 540 media and Syquest compatible media and outperforms the best sellers.

PC or MAC compatible!

Your Choice **Parallel Port or SCSI EXTERNAL**

- Downward Compatible with Syquest 270MB Disk
- 3X Faster than the ZIP 100
- 5X The Capacity of the ZIP 100
- Up to 5.3MB/sec transfer rate
- 512K CACHE •10MS seek time
- PC & MAC Compatible
- 2 YEAR WARRANTY-540MB Drive
- 5 YEAR WARRANTY-540MB Disk

\$209^{95}*

**AFTER $50 MFG. MAIL-IN REBATE (In-Store Price \$259^{95})*

Internal SCSI version - \$139^{95}*

**AFTER $50 MFG. MAIL-IN REBATE (In-Store Price \$189^{95})*

Specom

$200 Worth of software included

Specom
SuiteVision
YOU CAN SEE AND TALK TO ANYBODY IN THE WORLD FOR THE COST OF A LOCAL PHONE CALL.
Specom
Specom VideoCam

NEW!

VIDEO CONFERENCING KIT & COLOR CAMERA

Suite Visions

BUY 2 GET A $40 REBATE

- ● You can see & talk to anybody in the world for the cost of a local phone call
- ● Connect direct or through the internet using regular phone line or ISDN line
- ● Includes color digital camera, and all the software you need

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Rainbow Runner Studio

An Exciting New Universe of Digital Video

- State of-the-art video upgrades for Matrox Mystique®
- High Quality video editing on the PC
- Live video conferencing
- Hardware MPEG1 video playback
- Still and stream video capture
- TV viewing on the PC (Requires Rainbow Runner TV)
- Includes 'PC-VCR' feature

$CALL

Rainbow Runner TV...$CALL

3D, Entertainment & Multimedia Accelerator

Matrox Mystique

- ❖64-bit graphics accelerator for mainstream business & home
- ❖2MB or 4MB base boards (Upgradeable to 8MB)
- ❖Up to 1600X1200 resolution in 8, 16, 24-bit color
- ❖3D texture mapped games
- ❖170Hz ramdac
- ❖Windows 95, 3.11 & DOS
- ❖Bundled with: Mech Warrior 2, Destruction Derby 2 & Scorched Planet
- ❖Video upgrades available this fall

NEW!
New Lower Prices!
MYSTIQUE
3D Entertainment and Multimedia
matrox

2MB PCI Version 94^{95}*

MICROSOFT. WINDOWS.

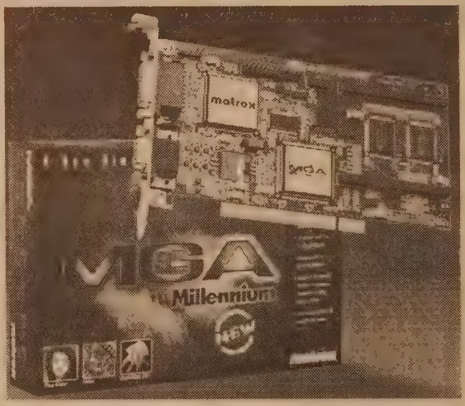
4MB PCI Version 124^{95}*

Rebate Expires 6/30/97

*After $25.00 mfg. mail-in rebate

Professional 3D, Graphics & Video Accelerator

Matrox Millennium



- ❖64-bit high performance professional graphics accelerator
- ❖2MB or 4MB base boards (upgradeable to 8MB)
- ❖Powerful dual ported WRAM memory
- ❖Windows 95, NT, 3.11, AutoCAD & Microstation
- ❖1600X1200 resolution in 8, 16 & 24-bit color
- ❖220Hz ramdac for refresh up to 85Hz
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- Increases EIDE data transfer rates up to 80%!
- Co-resides with other disk drive controller boards
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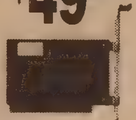

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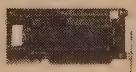

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16-Bit IDE, Floppy & QIC-80 Tape Accelerator Board

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- Doubles the speed of the 250MB or 420MB (QIC-80) tape drives
- Fully supports 2.88MB floppy disk drives
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GSI Model 32

16-Bit Multi-Port IDE, Floppy, Tape & I/O Accelerator Board

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- Doubles the speed of the 250MB or 420MB (QIC-80) tape drives
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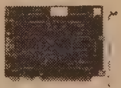

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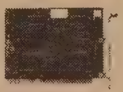

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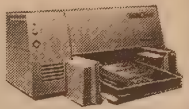

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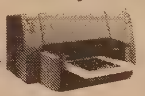

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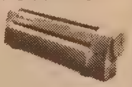
HP ScanJet 4s



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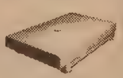

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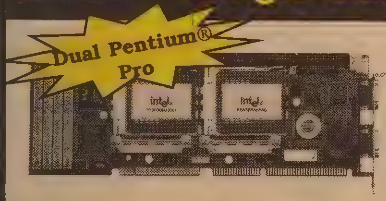

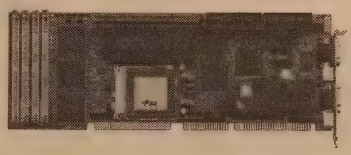

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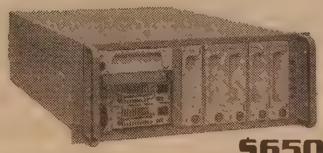

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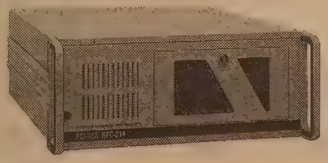

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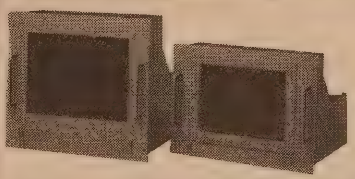

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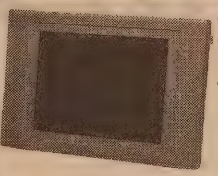

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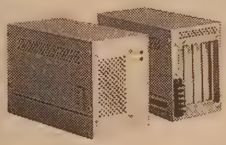

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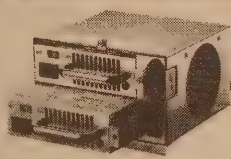

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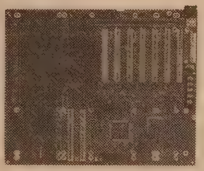

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INTERNET • BY JOHN S. QUARTERMAN

Texans Sue Spammer

ISPs Fight Back: The Inside Story

One month we opined about "Spam Considered Harmful." The next month we did something about it.

"Texans sue to recover damages for Internet 'spam', claiming electronic trespass and nuisance," says our press release of May 28, 1997 (*http://www.zilker.net/nospam.html*). It gives a whole new meaning to the state anti-litter slogan, "Don't Mess With Texas."

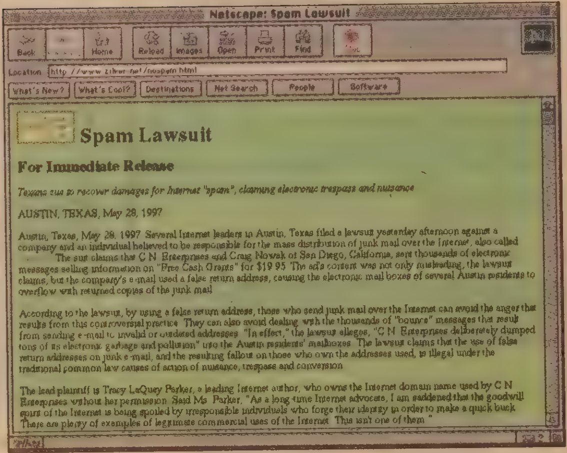
Who Are We Suing?

To quote the press release:

"The suit claims that C.N. Enterprises and Craig Nowak of San Diego, CA, sent thousands of electronic messages selling information on "Free Cash Grants" for $19.95. The ad's content was not only misleading, the lawsuit claims, but the company's email used a false return address, causing the electronic mail boxes of several Austin residents to overflow with returned copies of the junk mail.

"According to the lawsuit, by using a false return address, those who send junk mail over the Internet can avoid the anger that results from this controversial practice. They can also avoid dealing with the thousands of "bounce" messages that result from sending email to invalid or outdated addresses.

"In effect," the lawsuit alleges, "C.N. Enterprises deliberately dumped tons of its electronic garbage and pollution" into the Austin residents' mailboxes. The lawsuit claims that the use of false return addresses on junk email, and the resulting fallout on those who own the addresses used, is illegal under the traditional common law causes of action of nuisance, trespass and conversion.



Spam Lawsuit

For Immediate Release

Texans sue to recover damages for Internet "spam", claiming electronic trespass and nuisance

AUSTIN, TEXAS, May 28, 1997

Austin, Texas, May 28. 1997 Several Internet leaders in Austin, Texas filed a lawsuit yesterday afternoon against a company and an individual believed to be responsible for the mass distribution of junk mail over the Internet, also called The suit claims that C N Enterprises and Craig Nowak of San Diego, California, sent thousands of electronic messages selling information on "Free Cash Grants" for $19 95 The ad's content was not only misleading, the lawsuit claims, but the company's e-mail used a false return address, causing the electronic mail boxes of several Austin residents to overflow with returned copies of the junk mail

According to the lawsuit, by using a false return address, those who send junk mail over the Internet can avoid the anger that results from this controversial practice They can also avoid dealing with the thousands of "bounce" messages that result from sending e-mail to invalid or outdated addresses "In effect," the lawsuit alleges, "C N Enterprises deliberately dumped tons of its electronic garbage and pollution" into the Austin residents' mailboxes The lawsuit claims that the use of false return addresses on junk e-mail, and the resulting fallout on those who own the addresses used, is illegal under the traditional common law causes of action of nuisance, trespass and conversion

The lead plaintiff is Tracy LaQuey Parker, a leading Internet author, who owns the Internet domain name used by C N Enterprises without her permission Said Ms Parker, "As a long-time Internet advocate, I am saddened that the goodwill spirit of the Internet is being spoiled by irresponsible individuals who forge their identity in order to make a quick buck There are plenty of examples of legitimate commercial uses of the Internet This isn't one of them "

Why Sue?

My connection with the case is as an owner, with Smoot Carl-Mitchell, of Zilker Internet Park (*http://www.zilker.net*). The spammer sent the spam through Zilker, thus using our computing and network resources to forward it to its numerous destinations.

Spam is a huge waste of time and resources and it has no benefit to us or our customers. Not just us, either. This was the FREE CASH GRANTS spam that probably many of you, dear readers, got in your mailbox. It was also sent through other ISPs after it went through Zilker.

At Zilker, since about January of this year, we had been getting increasing amounts of spam.

*Given the amount of time we've spent dealing with spam in general, **the lawsuit is actually a small part of our anti-spam effort.** We thought it was worthwhile in order to **stop this spammer, to maybe collect a little compensation, and to set a precedent.***

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Texans Sue Spammer *continued...*

This particular spam was the last straw on an already overfull heap. It caused Zilker to have to put in elaborate spam blocks.

Given the amount of time we've spent dealing with spam in general, the lawsuit is actually a small part of our anti-spam effort. We thought it was worthwhile in order to stop this spammer, to maybe collect a little compensation, and to set a precedent. We've since sold most of the assets of Zilker to another ISP (although Zilker Internet Park, the corporation, continues to exist), so it's not even a matter of easing our ISP operations at this point.

This was also a particularly nasty spam. Like most spam, it had forged **From:** mail headers. Some of them weren't even syntactically correct, and those caused extra bounces, some of which resulted in bounce loops between mailers as far away as Australia. This made cleaning up the spam harder than it would have otherwise been.

Why Not?

The **From:** headers that were syntactically correct had the address of one of our customers. That caused our customer to get hate mail from people who thought they were writing back to the spammer. It also forced us to cut off mail from her domain temporarily in order to stop the spam.

In fact, the lead plaintiff in the case is that customer, Tracy LaQuey Parker, author of books such as the early best-seller *The Internet Companion* and the even earlier *Internet Directory*, which was one of the very first books about the Internet. With her business partners Patrick Parker (also her husband) and Peter Rauch, Tracy owns the domain flowers.com (*http://www.flowers.com*), which was the domain that appeared in the forged **From:** headers in the spam.

Parker says: "As a long-time Internet advocate, I am saddened that the goodwill spirit of the Internet is being spoiled by irresponsible individuals who forge their identity in order to make a quick buck. There are plenty of examples of legitimate commercial uses of the Internet. This isn't one of them."

Other Plaintiffs

Joining the Parkers, Rauch, and Zilker Internet Park are two organizations related to the Internet: Texas Internet Service Providers Association (TISPA), (512)303-1021, URL: *http://www.tispa.org* , and EFF-Austin, (512)444-5175, URL: *http://www.eff-austin.org* . TISPA successfully stopped an attempt by the State of Texas to impose a 1% gross sales tax on ISPs, so it means business.

Gene Crick, TISPA's president, says: "Increasingly, 'spammers' are using false return addresses to avoid taking full responsibility for the harm caused by their unsolicited commercial email. These forgeries dump huge volumes

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Texans Sue Spammer *continued...*

of unwanted junk mail onto Internet companies and their customers. TISPA would like to see the court grant a broad and clear injunction prohibiting this practice."

The Counsel

Peter Kennedy and Roger Williams of George, Donaldson & Ford, L.L.P., (512-495-1400, URL: *http://www.gdf.com*) are our legal counsel. They're among the most experienced Internet attorneys and law firms in the country. You may recognize them as the people who won Steve Jackson's lawsuit against the US Secret Service. They have agreed to take the case on contingency.

The From: headers that were syntactically correct had the address of one of our customers. ***That caused our customer to get hate mail from people who thought they were writing back to the spammer.*** *It also forced us to cut off mail from her domain temporarily in order to stop the spam.*

A Precedent

We hope to set a legal precedent. Even if we don't, we hope to make the problem of spam more prominent.

We seem to be succeeding, since even in the first day or so the suit was covered by *Wired*, *ComputerWorld*, the *Austin American-Statesman*, and various other publications. Our press release is also prominently featured on the sendmail home page (*http://www.sendmail.org*), and sendmail is the mailer most widely used by ISPs.

The Spammer

As of this writing, this case is still in the legal system, so naturally I don't want to say too much about it, nor about the defendant.

However, since he has already been quoted in the press as saying he didn't really mean to do it, let me just say that if someone is playing with an Uzi and shoots a bunch of people it doesn't help much to say he didn't really mean to do it.

Part of the problem with spam is that people don't realize how serious it is. We have a small group of people (hundreds, maybe a thousand) abusing key features of the Internet to the detriment of thou-

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Texans Sue Spammer *continued...*

sands of ISPs and millions of people. Nobody profits but the spammers. Lots of people lose. Spam won't stop until it becomes socially unacceptable to spam. We hope we are helping to make that happen.

What Can You Do?

Well, the title of the previous article, "Spam Considered Harmful" is, as all good computer science students will recognize, a play on a famous article by Edsger Dijstra: "Goto Considered Harmful."

I still fondly remember what he said when I offered him a UNIX account just after he took a faculty chair at the University of Texas. He did the same thing Donald Knuth of Stanford has done more recently. He refused to have an electronic mail address, so as not to get electronic junk mail. For those who don't recognize the names, these are two of the most eminent figures of all time in computer science, so one shouldn't take their opinions on this matter too lightly.

However, if your main occupation is not mulling over deep issues for long periods of time, and instead you need ongoing contact with the outside world, shutting yourself off from electronic mail may not be an optimal solution for you.

If spam is as much a problem for you as it is for us, sue, if you can. If you don't believe it's a problem, or you don't know what technical fixes you can apply, read up on the subject. For example, see *http://www.mids.org/nospam/* and *http://spam.abuse.net* . Send us mail (*spamsuit@zilker.net*). Better still, write a letter to an editor, call a radio talk show, appear on television.

Or just don't agree the next time somebody tries to tell you spam is nothing but business. It's not business, it's abuse. Let's stop it. ■

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See, we've got this thing called a telephone system. The public has paid for this system and its infrastructure many times over. What telco monopolies like PacBell (and AT&T before it) do is say, "Hmmm, what kind of ersatz service can I create where I can charge outrageous fees for adding very little to what already exists and was paid for by someone else, and still get the state and federal regulatory agencies to endorse it and get them to call it a monumental saving to the general public?"

Case in point: The Baby Bells were charging long-distance companies through the nose for "access" to the local lines and customers. Huge windfall for the regional Bell operating companies (RBOCs)—more than $23 billion annually, or half the cost of an average long-distance call. For nothing—just "access." The RBOCs probably spent more to figure out how to hack a billing system for it than anything else. Pure profit. But the long-distance companies passed these access fees onto their customers, so don't sweat for AT&T.

Now AT&T and others have convinced the FCC that these outrageous access fees were, well, outrageous, so let's lower them and we'll pass the savings along to our long-distance customers. So it's still a wash for AT&T, but now they'll give us the come-on that they've lowered their rates 5%. Meanwhile, the FCC lets the RBOCs replace the "lost" revenue from the lower access fees with something else—higher fees for additional phone lines. Let's say you've got 3-6 existing telephone lines for your home-based business. Zoom this: All of a sudden, for no apparent reason or added value, those line that are already installed and paid for are now going to cost you $150 more per year.

Consumer long-distance rates might decrease a whopping 8%, so businesses can expect to see lower long-distance fees. But in the end they'll watch their telephone bills go up because the cost of multiple business lines could go up by $2.00 per line. Your local Internet Service Provider is probably at the neighborhood knife store browsing books on hara-kiri.

> Let's say you've got 3-6 existing telephone lines for your home-based business. Zoom this: ***All of a sudden, for no apparent reason or added value, those lines that are already installed and paid for are now going to cost you $150 more per year.***

Don't forget the kids, either. The FCC deal also sets up a $3 billion annual account for hotwiring the nation's other great incredibly inefficient gubbermint-sponsored monopoly, the so-called non-discriminatory public schools. Supposedly residential lines are not priced at their true cost and are subsidized by about $1.50 each. The FCC decided that subsidy money should go to the schools. So instead of finding the money for this program by asking the RBOCs to run a tighter ship, they are going to gouge consumers instead. The money is supposed to pay for anywhere from 20-90% of a school's Internet phone bill, depending on how impoverished the facility is, based on the number of students enrolled in the school lunch program. Non-profit, rural health care centers will have a similar pool of $400 million.

In a brief snit of sanity, the FCC rejected an RBOC proposal that would have imposed a 1-3 cents-per-minute tariff to Internet providers like AOL for access to local telephone lines. In any event, these pricing mandates go far beyond the scope of the Telecommunications Reform Act. Who needs Congress or out-of-control judges when you've got the FCC?

Even so, what was Reed Hundt thinking when he traded lower long-distance access fees for AT&T for the Baby Bells' increasing fees for extra phone lines to subsidize schools? Maybe he was thinking about how the more things change the more they stay the same. Despite the hoopla of the Telecommunications Reform Act of 1996, it's still the same old government-sponsored monopoly mentality that continues to assume archaic and Byzantine telco pricing loopholes, customer-be-damned policies, and state-subsidized jobs programs disguised as school districts. If you find any real telecommunications

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Online Services *continued...*

reform out there, please be sure to report it to my online Web conference area at: *http://worldview-bbs.com/TelcoConfs* .

CompuServe Revs Up

CompuServe has revved up both its service and marketing. Not content to play second fiddle to any of America's online services, the company has reorganized itself and plans to spend the big bucks to keep customers and win new ones. Five million current subscribers isn't peanuts, after all.

First up is CompuServe's (CSi) reorganization of its online service into twenty-one distinct areas or "communities." If you haven't logged on for awhile the new areas are: News and Weather, Business, Professions, Research, Investing, Personal Finance, Computing Support, Computing Pro, Health, Education, Arts and Entertainment, Society and Living, Travel, Sports, Home and Recreation, Sports, Games, Sight and Sound, Internet, Communications Center, Shopping, and a Find/Search area, sort of a topical Lost and Found.

Within these communities CSi supports over 1,000 highly active online forums where members with similar interests share knowledge, experience, opinions, and advice through real-time discussions, message postings, and through browsing the extensive file libraries available under each topic. Additionally, the Forums and other content within each community provide links to related World Wide Web sites.

This follows last fall's introduction of the CompuServe 3.0 client interface software, which enabled pretty good integration of CSi and the Internet. The software enables users to link to Web content directly from the new community menus. Later this year, CSi plans to offer a new version of itself, one utilizing Internet standards. This will allow users to access the service via any Internet Service Provider (ISP) using any standard Web browser like Netscape Navigator. In this rev, each CSi community will become its own Web site, which the users can access using some password. It will also help CSi focus on the work of accommodating more and more users and presenting the service in a more compelling manner, rather than trying to stuff open Internet technology into its older proprietary architecture. The bet on the Web also allows CSi to market itself directly via the Web, opening up many new co-marketing opportunities with ISPs.

All of this comes after last year's corporate soul-searching in Columbus, concluding that business users were the company's main target customers. Everything flows from that, including some studly marketing dollars skipping the mass market in favor of a 2.5 million piece mailing aimed at business, professional and technical users. Targeted advertising to sophisticated users will backup the promotions planned.

Ongoing member communication programs will work on member retention with tip sheets, email marketing, and an online newsletter for advanced users. According to Scott Kaufman—

continued on page 170

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C-120T	Pentium™/120	8MB	1.0GB	11.8" SVGA TFT	$2698.
M-120T	Pentium™/120	16MB	1.0GB+4X	11.8" SVGA TFT	$2948.
M-133T	Pentium™/133	16MB	1.0GB+6X	11.8" SVGA TFT	$3448.
E-133T	Pentium™/133	16MB	810MB	11.3" SVGA TFT	$2548.

IBM

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Model	Processor	Ram	HD	Screen	Price
ThinkPad 760XD	MMX/166	32MB	3.0GB	12.1 ACTIVE	IN STOCK
ThinkPad 760XI	MMX166	16MB	2.1GB	12.1 ACTIVE	$4???.
ThinkPad 760XL	MMX/166	32MB	2.1GB	12.1 ACTIVE	CALL
ThinkPad 760E	Pent-™/150	16MB	2.1GB	12.1 ACTIVE	$3998.
ThinkPad 760ED	Pent-™/133	16MB	2.1GB	12.1 ACTIVE	$4348.
ThinkPad 560	Pent-™/133	8MB	1.08GB	12.1" SVGA TFT	$3998.
ThinkPad 560	Pent-™/133	8MB	2.1GB	12.1" SVGA TFT	$4298.
ThinkPad 365XD	Pent-™/120	8MB	1.08GB+6X	10.4" SVGA TFT	$1678.
ThinkPad 365XD	Pent-™/133	8MB	1.35GB+6X	11.3" SVGA TFT	$2598.

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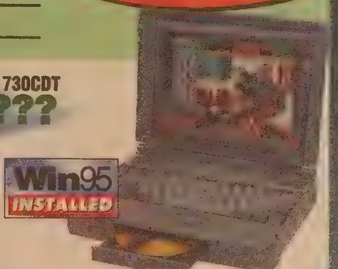
Extensa 650CD	Pent-™/133	16MB	1.35GB	12.1" SVGA DSTN	$1868.
Extensa 650CDT	Pent-™/133	16MB	2.1GB	11.3" SVGA Active Clr	$2798.
Extensa 660CD	MMX/166	16MB	1.35GB	12.1" SVGA DSTN	$2728.
Extensa 660CDT	MMX/166	16MB	2.1GB	11.3" SVGA Active Clr	$3208.
Extensa 900	Pent-™/133	16MB	1.35GB	12.1" SVGA DSTN	$2158.
Extensa 900T	Pent-™/133	16MB	1.35GB	11.3" SVGA Active Clr	$2528.
Extensa 900CDT	Pent-™/133	16MB	1.35GB	11.3" SVGA Active Clr	$2908.
TM-6020	Pent-™/120	8MB	1.08GB	11.3" SVGA Active Clr	$2048.
TM-6030	Pent-™/133	16MB	1.35GB	12.1" SVGA Active Clr	$2328.
TM-6050	Pent-™/150	16MB	1.35GB	12.1" SVGA Active Clr	$3078.
TM-6160	MMX/166	32/96MB	2.1GB	12.1" SVGA Active Clr	$4658.



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TECRA 730CDT $5???

TECRA 510CDT $4???

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440CDX	P133-MMX	16MB	1.34GB+10X	12.1" Fast Scan	$2438.
440CDT	P133-MMX	16MB	1.34GB+10X	12.1" Active Clr.	$3318.
460CDT	P166-MMX	32MB	2.02GB+10X	12.1" Active Clr.	$4188.
3600CT*	486 DX2-50	8MB	500MB	8.4" Active Clr.	$1098.
650CT*	Pentium™/133	16MB	1.2GB	11.3" Active Clr.	$3038.
660CDT*	Pentium™/150	16MB	1.35GB+10X	11.3" Active Clr.	$4378.
500CDT	Pentium™/120	16MB	1.2GB+6X	12.1" Active Clr.	$2918.
510CDT	Pentium™/120	16MB	2.1GB+10X	12.1" Active Clr.	$3398.
520CDT	P166-MMX	32MB	2.02GB+10X	12.1" Active Clr.	$4578.
530CDT	P166-MMX	32MB	2.02GB+10X	12.1" Active Clr.	$4968.
730XCDT	P150-MMX	16MB	2.1GB+6X	12.1" Active Clr.	$4668.
740CDT	P166-MMX	16MB	3.0GB+10X	13.3" Active Clr.	$6328.
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OmniBook 5700CT	MMX/150	16MB	2.0GB	12.1" SVGA TFT	$4368.
OmniBook 5700CT	MMX/166	16MB	2.0GB	12.1" SVGA TFT	$4618
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Versa 2650CDT	Pent-™/150MMX	16MB	1.44GB+10X	12.1" SVGA TFT	$3838.
Versa 2650CD	Pent-™/150MMX	16MB	1.44GB+10X	12.1" SVGA DSTN	$2878.
Versa 2430CD	Pent-™/133	16MB	1.08GB+6X	11.3" SVGA DSTN	$3608.
Versa 2530	Pent-™/133	16MB	1.08GB	12.1" SVGA DSTN	$1948.

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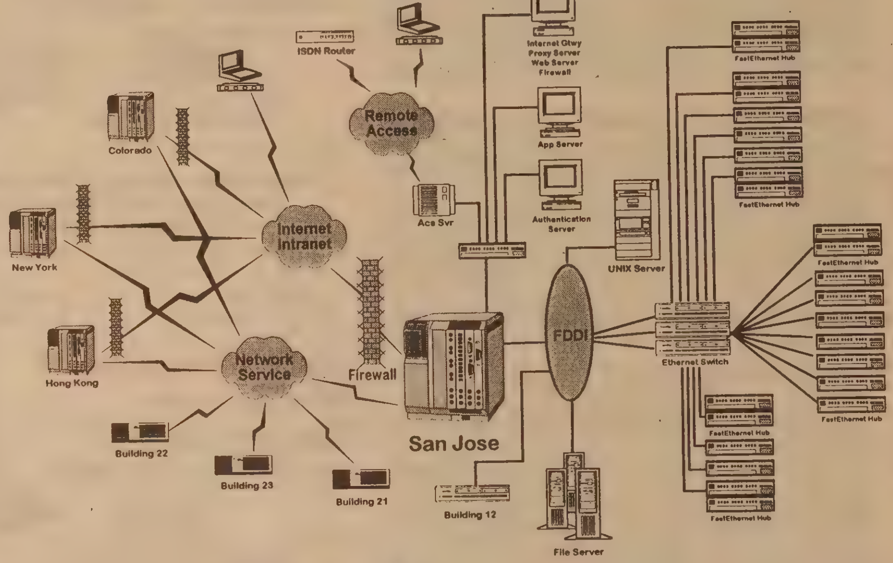
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Online Services *continued from page 166*

practically reading from any text on Integrated Marketing Communications—"By understanding the specific criteria on which various segments of the market make their purchasing decisions, we anticipate that our marketing efforts will be much more successful than the mass consumer approach we tried in the past." Uh-huh.

This Ole Web site

Check out the Web site of PBS's "The Antique Roadshow" (*http://www.pbs.org/wgbh/pages/roadshow/appraiseit.html*). There you can find information concerning the show's broadcast times for your area and information about the show. "The Antique Roadshow" goes from town to town; its appraisers tell people who bring in their knickknacks that the trinket they've used for a doorstop for eight generations is worth $12 million. I'm always fascinated to see what people hang onto and think valuable.

One of the links on the site provides an alphabetical listing of the various appraisers the show uses including that person's specialty. Another link gives a brief description of the leading Auction Houses including Butterfield's, Christie's, Doyle, Skinner, and of course Sotheby's. Another treat on the site is a monthly contest called Appraise It Yourself. This contest shows a painting or some other object, and then through a series of questions about the object you guess at several critical factors—date of the painting, what is the nature of the smudge, why use a pine frame, etc. If you get all of that right, you get to make your own dollar appraisal from a multiple choice. Monthly winners get a valuable prize, usually some reference work on collecting.

"The Antique Roadshow" is rather mobile. It will be visiting the Bill Graham Civic Auditorium in San Francisco on Saturday, August 9th. The site explains how you can apply to have large items considered for evaluation by one of the experts, including two-way freight. Hand-carryable walk-ins are encouraged, but you're limited to two items per person.

I wonder how much of an antique they would consider the FCC? ■

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Despite the hoopla of the Telecommunications Reform Act of 1996, it's still the same old government-sponsored monopoly mentality that continues to assume archaic and Byzantine telco pricing loopholes, customer-be-damned policies, and state-subsidized jobs programs disguised as school districts.

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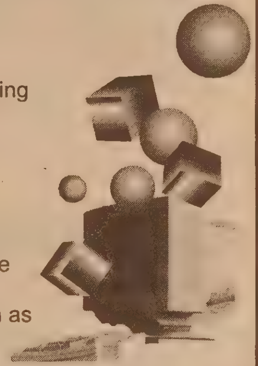

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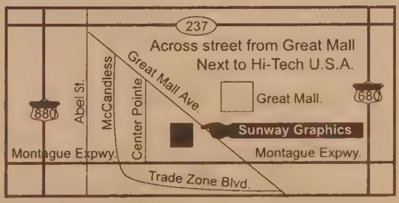

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BY MICHELLE V. RAFTER

Micropayments: Are They Finally Real?

Companies Polish New Offerings

Micropayments haven't caught on as quickly as digital-cash vendors expected—but nobody's throwing in the towel. Top players such as Digital Equipment, CyberCash and First Virtual are jumpstarting their respective efforts by signing far-reaching partnerships and boosting marketing programs to attract online merchants, and ultimately, consumers.

Micropayments, or microtransactions as they're sometimes called, collectively describe digital payment methods that stand in for hard currency—coins and paper money—in online transactions, usually involving small-ticket items of a penny to $10.

Detractors say electronic financial transactions never fly—they claim people won't give up their paper money and plastic. But supporters believe the market for micropayments is enormous. Why? Think of all the things people buy in the physical world with cash—single issues of a newspaper or magazine, copies from a copy machine, postcards, movie tickets, CDs, and on and on. Now imagine how people would buy some of those same items online. Credit cards are overkill; for many low-priced goods or services, the value of the sale isn't worth the credit-card transaction fee a merchant would incur.

Enter micropayments. The newest is from Digital Equipment, which unveiled the Millicent micropayment system at Spring Internet World in Los Angeles. Millicent consists of three Internet-compatible parts: virtual-wallet software consumers use to buy online content worth 1/10th of a cent to $5; merchant server software for accepting payments; and broker server software for handling the transactions. With Millicent, a consumer uses a credit card or debits their checking account to pay a bank or other broker for scrip they can exchange online for information, services or subscriptions from Millicent-enabled merchants. Merchants collect the scrip and forward it to the brokers, who reimburse them via standard electronic funds transfers or printed checks.

Using CyberCash's CyberCoin product, consumers can buy digital currency in $20 increments with funds from a checking account or credit card, store it in a CyberCash virtual-wallet software program on their hard drive and use it online to pay for newspaper articles, games, digital art and other goods and services.

First Virtual Holdings' payment system lets shoppers purchase one or many small items using a Virtual PIN—an identification number that stands in for a credit-card number—and confirm purchases via email.

A fourth option comes from Dutch-based DigiCash, whose US licensee is Mark Twain Bank in St. Louis. Consumers open a special world-currency checking account at Mark Twain, buy DigiCash's Ecash currency, store it at the bank or on their hard drive and use it to buy and sell goods and services.

How It Works, Who It's For

As with credit-card purchases, merchants pay a small transaction fee for micropayments, though the amount varies with the vendor. First Virtual, for example, charges 2% of the transaction cost plus 29 cents. CyberCoin transactions operate on a sliding scale.

> THINK OF ALL THE THINGS PEOPLE BUY IN THE PHYSICAL WORLD WITH CASH—SINGLE ISSUES OF A NEWSPAPER OR MAGAZINE, COPIES FROM A COPY MACHINE, POSTCARDS, MOVIE TICKETS, CDS, AND ON AND ON. NOW IMAGINE HOW PEOPLE WOULD BUY SOME OF THOSE SAME ITEMS ONLINE.

Digital wants to put banks in the driver's seat of its three-part payment solution, which the company is testing internally before launching a public trial in the summer. "Good (Millicent) brokers are organizations that are recognized by consumers and have a high degree of trust" such as banks, says Russ Jones, a Digital manager involved in the project.

Digital is purposely leaving many details of how the system will be implemented up to its broker partners, which in addition to banks could include Internet Service Providers, national online services, and outside the US, government-sanctioned telephone and postal agencies, Jones explains. Those details include how a consumer pays for scrip, minimum purchase amounts, minimum per-transaction fees brokers will charge merchants and how often brokers will reimburse merchants for scrip they turn in.

Digital expects to make its money selling broker and merchant software. Digital has already partnered with Bank of Ireland and Tele Denmark to act as brokers for the payment system during a private test this spring among 45,000 Web-enabled Digital employees. The company

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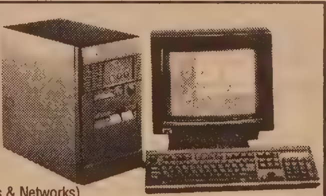

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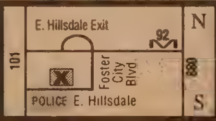

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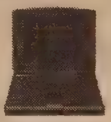

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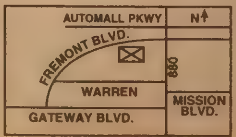

GOLDEN MICRO COMPUTERS

Micropayments *continued...*

expects to announce other US banking partners before the public beta begins in summer.

On the merchant side, Digital believes Millicent will be attractive to online publishers interested in selling information by the article, and to software publishers looking to sell Java applets and other software on a per-use basis to NC users. Already, Reuters and InfoSeek have signed on as content providers for the tests.

Slow Start, Big Plans

For vendors who've offered microtransactions longer, the going has been slow. Since CyberCoin's September 1996 launch, only thirty online merchants have integrated the payment method into their Web stores; another forty are still in the planning stage. In late March, CyberCash confirmed ESPN SportsZone and Playboy Enterprises would incorporate CyberCoin payments on their respective Web sites for premium services and pay-per-view events.

> SOME INTERNET COMMERCE WATCHERS BELIEVE MICROTRANSACTIONS WON'T BECOME UBIQUITOUS UNTIL SOFTWARE IS INCLUDED IN WEB BROWSERS, A DEVELOPMENT BOTH MICROSOFT AND NETSCAPE ARE REPORTED TO BE WORKING TOWARD.

One early CyberCoin merchant was Virtual Vegas, a Santa Monica gaming site that offers it as a payment option for buying game software and sports betting tips. "We've done a few thousand dollars worth of sales at 25–50 cents a pop. It's kind of a trickle, but we haven't been marketing it either. It's a chicken and egg situation," says David Herschman, Virtual Vegas president.

France Telecom's Questel-Orbit division in Vienna, VA tested CyberCoin for four months and expected to begin offering it by the end of March as a payment option for searches of its database of 1.8 million US patent applications. "The holdup has been on our part...finalizing our business model of how we'll charge for our content," according to Paul Albert, a Questel-Orbit consultant.

More than a million people have downloaded CyberCash wallets, but to date, only 5,000 have used them for CyberCoin transactions. To boost that figure, CyberCash ran a $10,000 sweepstakes from October through January. In different promotion, First Union Corp., the country's #6 retail bank, is offering a co-branded CyberCash wallet on its Web site, and built a mini-mall of CyberCoin merchants on the site to get consumers' attention.

In another marketing effort, CyberCash plans to open a CyberCoin-based clearinghouse for publishers, called Digital Newsstand,

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Micropayments *continued...*

that will sell single-day subscriptions to the *Los Angeles Times*, Quote.com, Bloomberg, *American Banker* and other publications. The service, which will be promoted on Yahoo!, Lycos and InfoSeek, requires that merchants insert a 100-line CGI script into their site that enables them to accept CyberCoin payments. Sales will be split between the merchant, CyberCash and promoters. "It's designed for merchants who are still struggling with their business plan for microtransactions," says CyberCoin Product Manager Larry Gilbert.

Fresh from an initial public offering that raised $18 million, First Virtual is pouring resources into marketing its Virtual PIN, which currently is offered by more than 3,000 mainly small merchants and used by approximately 200,000 consumers who each pay $2 to register. First Virtual recently hired marketer Harte-Hanks Direct to conduct online and offline direct mail campaigns and create a buyers club that would give away merchandise and subscriptions to people who use the payment service.

In another marketing move, First USA Paymentech, a major credit-card processor and First Virtual investor, is promoting the Virtual PIN in a consumer newsletter it publishes and has hired marketer Donnelly Direct to help reach its goal of signing up one million Virtual PIN holders by May 31.

"We've been hammering on the technology side of our business and how we're getting ready to launch as a marketing company. We're ready to take off," says Pierre Wolf, First Virtual marketing director.

First Virtual also has high hopes for a deal with Microsoft, which is embedding Virtual PIN technology in Merchant Server Web commerce software expected to be released in spring.

Despite their efforts, some Internet commerce watchers believe microtransactions won't become ubiquitous until software is included in Web browsers, a development both Microsoft and Netscape are reported to be working toward. Others believe microtransactions will hit it big only when they're included in smart cards that people plug into a card reader attached to their home PC, load up with cash and use anywhere. ■

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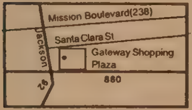

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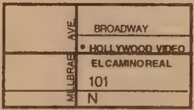

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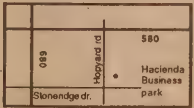

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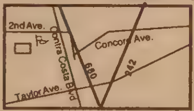

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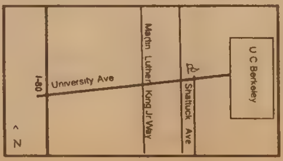

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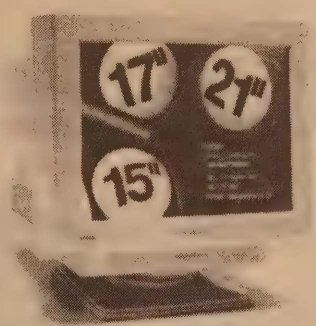

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- Prices and availability are subject to change without notice or obligation.
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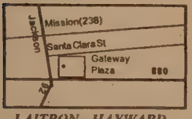
- Prices reflect cash discount.
- All returns must have prior authorization.
- All returns must be in original packaging complete with manual, software,...etc.
- 15% restocking charge on returns after three days.
- Laitron Computer is not responsible for any typography errors.
- All Prices are final on the date of purchase.
- Some Items may require special orders.

Email: sales@laitrons.com



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Hayward, CA 94544
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Sat 10:00 am - 4:00 pm
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email hayward@laitrons.com

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San Jose, CA 95123
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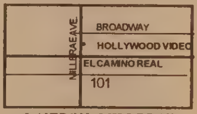
(408)978-9898 Fax (408)978-9901
email alamaden@laitrons.com



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MILLBRAE, CA 94030
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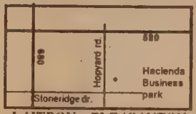
email: millbrae@laitrons.com



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Pleasanton, CA 94566
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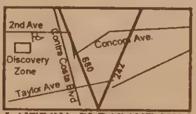

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Pleasant Hill, CA 94523
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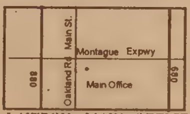

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1550 Montague Expressway
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Tech Support (408)321-9353
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Web Page Listings

COMPUTER PRODUCTS & SERVICES

Abacus Computers *http://www.computers-online.com* Full service solutions provider. Authorized distributor of Cisco, Novell, Ascend, 3COM, U.S. Robotics, PacBell, and others. [Exp. #168.]

Adlen Computing Consultants *http://linex.com/~alden/* PC tutoring and consultation, Web page creation, 3-D animated graphics. Based in Berkeley, CA. [Exp. #166.]

Axis Systems *http://axissys.com* Web site offering useful product information and specs. [Exp. #168.]

Cadd/Engineering Supply *http://www.cesplot.com/* With over nine years of experience in supporting the CAD market, we have built a reputation for exceptional pricing and outstanding customer service. [Exp. #168.]

CD Design *http://www.cddesign.com/* I Ching PC software for Win3x/95. Download free demos. [Exp. #167.]

Centura Software Corp. *http://www.centurasoft.com* Centura Software (Formerly Gupta Corp.), provides products, such as ForeSite, for developing and deploying high-performance Web-based and client/server applications. [Exp. #168.]

Complete Computer Solutions *http://www.cscorp.com* Local Area Networks, custom software, downsizing, Web page creation, system upgrading. [Exp. #167.]

Dadaware *http://www.dadaware.com* Features Embellish, image editing software. [Exp. #167.]

Dad's Computers *http://members.aol.com/g2bitln/index.html* Custom build, repair, and upgrade computers. Offering Internet research and tech support. [Exp. #167.]

Free Flight *http://www.free-flt.com* Free Flight, a moving map application with 3-D terrain, makes aeronautical navigating easy. [Exp. #168.]

HiTek Solutions, Computer Education Centers *http://www.hiteksolution.com/hiteksolution/* Novell and Microsoft certification training providers. (714) 474-8270. [Exp. #168]

Magictek Computers, Inc. *http://magictek.com* Complete computer services, custom design, online sales,pricing—your one stop shop. [Exp. #168.]

Match Fonts Mac & Windows *http://www.matchfonts.com* Great original fonts, foreign language fonts, and tools for DTP, artwork, word processing. Free samples. [Exp. #167.]

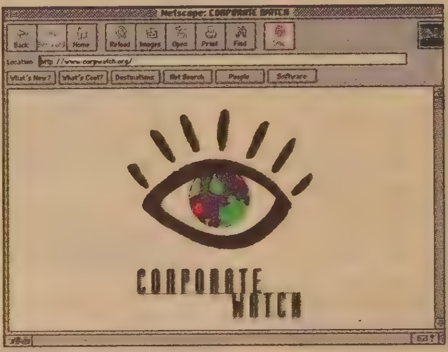
MegaMemory *http://www.megamemory* Computer memory for PCs, Macs, Powerbooks, Thinkpads, Newtons, and EDO memory. New, lifetime warranty, free 2nd-day shipping. [Exp. #167.]

Moniserv, Inc. *http://www.moniserv.com/* Mac/PC monitors for sale. Sony 17" $249 (MAC), 19" $499 (PC/MAC). Six-month warranty. [Exp. #166.]

PagersOnLine *http://www.pagersonline.com* Pagers, numeric and alphanumeric service. Local, regional, and national coverage. Rent or buy. [Exp. #167.]

PC Express *http://www.happysite.com* Online PC sales, art gallery, music, Web site design and graphics. [Exp. #166.]

S.S. International Web Page *http://www.ssinternational.com* Software developers for the world. [Exp. #168.]


Netscape: CORPORATE WATCH
Back
Home
Reload
Images
Open
Print
Find
Location
http://www.corpwatch.org/
What's New?
What's Cool?
Destinations
Net Search
People
Software
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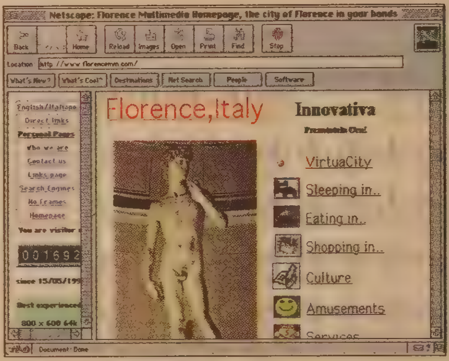
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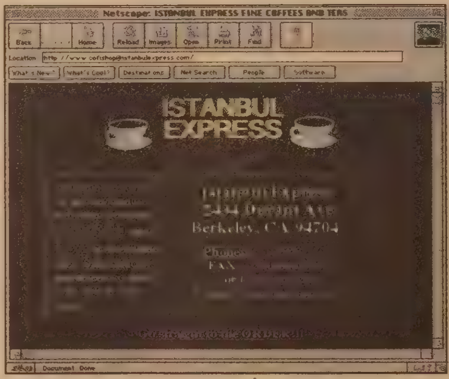
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T22 Systems *http://www.t22.com* Complete PC systems, custom system, and network integration, as well as PC upgrade, repair, and on-site services. [Exp. #166.]

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UNIX Power For PCs. *http://www.suse.com* Learn about the German Linux distribution (UNIX for PCs), SuSE Linux. [Exp. #167.]

WordPerfect Headquarters *http://www.wp.com/MacroExpert* WordPerfect tips, articles library. Law office support: training, productivity planning, and more. [Exp. #167.]

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A+Net *http://www.abac.com* Southern California's total Internet solution. Connect plans from $3.33/mo. Business services and merchant servers. [Exp. #168.]

Alpine Solutions *http://www.aplines.com* Alpine Solutions GeoFind service provides Internet-based business locator capabilities to business. [Exp. #168.]

Brad Sadler's Web Design *http://www.amer.net/users/malaya/* Offering striking Web design and ten years of marketing experience. 25% discount for non-profits. [Exp. #168.]

Connecting Business To The Future *http://www.connectx.com* Internet and intranet business solutions. [Exp. #168.]

Crash Course On The Internet *http://www.choicemall.com/crashcourse* A five hour video training series instructed by NASA Internet Specialist Brian Kowal. [Exp. #166.]

Dana Point Communications—BeachNet *http://www.beach.net* A complete network systems integrator providing full service Internet and intranet solutions for business. [Exp. #166.]

DEK Productions *http://home.earthlink.net/~bacdoc/dek.htm* Web page design and LA local video services with full digital capabilities. [Exp. #168.]

The Drink Exchange *http://www.drinkexchange.com* DrinkExchange's mission is to help Web professionals promote themselves by fostering an off-line community where what you provide is roughly proportional to what you imbibe. [Exp. #168.]

Elsop Webmaster Resource Center *http://www.elsop.com/wrc/* A Web site for Webmasters that contains the best links and most comprehensive coverage of computer industry trade publications, Web site development, HTML servers, software for Webmasters, and more. [Exp. #167.]

Equilio Web Design *http://www.equilio.com* Web page design packages for starters ($300), designers ($600), and professionals ($1,000 and up). [Exp. #168.]

First Light Internet Services *http://www.firstlight.net* Unlimited PPP accounts, $19.15/mo. [Exp. #168.]

Freedomstarr Communications, Inc. *http://www.freedomstarr.com/?vi5334151* A free Web page for serious entrepreneurs or Internet business starters. Customizable or automatically maintained. [Exp. #168.]

Global Web Marketing, Ltd. *http://www.gwn.co.uk* Internet design, design franchises, fax broadcast, email marketing (UK). [Exp. #168.]

Hyper Design Services *http://www.hyperds.com* Bay Area Web site design. Providing economical packaged services for business. [Exp. #167.]

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InternetConnect *http://www.internetconnect.net* Full service Web site hosting and development. Complete coprorate Internet access solutions. [Exp. #168.]

Internet-Frontier *http://internet-frontier.net* Full Service Internet Access Provider. Low prices, reliable services, local access. [Exp. #168]

Ironlight Digital *http://www.ironlight.com* Providing the marketing, design, and network services necessary to establish an innovative and lucrative Internet and intranet presence. [Exp. #166.]

JPNW *http://www.jpnw.com* Webmasters What Wonderous Webs We Weave. Specializing in putting small- to medium-sized companies on the Internet at the lowest possible price. [Exp. #168.]

MARINTERNET *http://www.marinternet.com* Internet for Marin residents. Locally owned and operated. Online users 30 days free for switching. $19.95 [Exp. #168]

Maztek Consulting *http://members.aol.com/imazdeh/index.html* Provides services for the Internet intranet user community. [Exp. #167.]

mmm-MultiMedia Company *http://www.mmmMultiMedia.com* Specialists in Web site development and entertainment. [Exp. #168.]

NetCiti *http://www.NetCiti.com* NetCiti can design and market your Web site(s) on the Internet. [Exp. #168.]

Outta Site Web Design *http://www.drjack.com/outta_site* Creative Web page design and consultation. Large graphics and animation library. Great prices. [Exp. #168.]

P-Net *http://www.p-net.com/* P-Net offers complete design, service, and support for your Web pages, including HTML coding, CGI scripting, and scanning. [Exp. #168]

Pacific Business Systems *http://www.pbs1.com* Internet access and Web page housing. First month free. (714)452-9110. [Exp. #168.]

Phobe.com *http://www.phobe.com* Web development services, graphic design, 'zines, rampant silliness, strange scientific experiments, and more. [Exp. #166.]

Red Shift Internet *http://www.redshift.com* Local calls to San Jose, Santa Clara, Cupertino, Sunnyvale, Mtn. View, and more. Unlimited access $16.95/mo. [Exp. #168]

SamGel's Web Design *http://members.aol.com/SamGel* Offering Active X and Java animation for exciting non-static Web design. Custom graphics that are well-designed and clean. [Exp. #168.]

San Francisco Ad Net *http://www.sfadnet.com* Professional Web page design and domain name starting at $99. Get a free ad in our online classifieds. [Exp. #166.]

San Jose Web *http://www.sanjoseweb.com* Web hosting solutions for users of Microsoft FrontPage. [Exp. #168.]

SISNA San Jose *http://www.sisna.com/sanjose* Unlimited access as low as $17/mo. Special student rates as low as $12/mo. [Exp. #168]

Taiwan Universal Commerce Information Center *http://www.commerce.com.tw* Taiwan's largest commerce Web server, specializing in trade, industry, business, manufacture, as well as import/export information. [Exp. #168.]

TLC Net Server *http://www.tlcs.com* Full Internet access, custom-designed interactive servers for your business or home. Free interactive software. [Exp. #166.]

Watson World Wide Enterprises *http://w3ent.com* Web page design, hosting, Internet commerce, marketing, and iMALL adertising. [Exp. #168.]

Web Design & Web Hosting *http://www.webbnet.com/* Exciting Web page design, development, storage, full PPP accounts, data base integration, credit card verification, email/fax gateway. [Exp. #167.]

Web House *http://www.masterm.com/webhouse.html* Affordable Web hosting, design, and promotion. [Exp. #168.]

Weblink.com *http://www.weblink.com* Offers friendly and professional site design services and standard server use. [Exp. #168.]

Wicked Styles Website Design *http://www.wickedstyles.com/design/* Low-cost, professional looking Web page design for personal and business use. Quick turnaround and affordable rates. [Exp. #166.]

WOLNET *http://wolnet. com* Complete Internet Service Providers. [Exp. #168.]

Wonderwidgets *http://www.wwi.com* Full service ISP based in Redondo Beach, serving the South Bay Area. We are inexpensive and very experienced. [Exp. #166.]

WRM & Associates *http://beaumont.net* Discount fixed price Web site hosting. We have the best service and pricing on the Net. [Exp. #168.]

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ABC Storybooks *http://w3net.com/abcstorybooks.htm* Personalized storybooks, as well as Barney, McGruff, Precious Moments, and Presto Sticker books. Disney titles and more. [Exp. #168.]

An Entrepreneur Opportunity *http://www.aable.com/ihi/isr/ca/johnf* Serious income potential working at home. Serious compensation and benefit structure. [Exp. #168.]

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AUS Multicam Systems Australasia *http://multicam.com.au* Australian designed and manufactured Multicam router, routing tables and machines. [Exp. #168.]

BioMedtrix *http://www.biomedtrix.com* Develops and manufactures implants and instruments that address Canine Hip Dysplasia. [Exp. #167.]

Black Hills Virtual Mall *http://www.mall.blackhills.com* Black Hills businesses online. [Exp. #168.]

The Booksmith *http://www.booksmith.com* San Francisco independent bookstore—computer books, fiction, sci-fi, film, erotica, cookbooks, and sale books. [Exp. #168.]

The Car Lot *http://www.webms.net/cars/* Buy or sell used cars on the Internet. Free service includes color photo with ad. [Exp. #168.]

Carvin-Wang International *http://netcentermail.com/scan* Have any positive print, photo, or brochure scanned to JPG, GIF, transparent GIF and emailed back. [Exp. #167.]

Club Export *http://www.club-export.com* The best export shop for French fashion, accessories, furniture, jewelry, cooking utensils, tourism, and health products. [Exp. #168.]

Collect On Judgements *http://www.sbcr.com/judical.html* Judicious judgement collection. You don't get paid, we don't get paid. [Exp. #167.]

Commercial-directory.com *http://commercial-directory.com/free-ads* Place free classified ads in hundreds of newspapers worldwide. [Exp. #166.]

Cybermation *http://www.cybermationsys.com* SCK-2000 Motion Control System for robotics, lasers, industrial control, and more. [Exp. #167.]

Discreet Medical, Inc. *http://www.discreetmedical.com* Provider of discreet healthcare products, including HIV tests, condoms, hair-loss treatment, and stop-smoking kits. [Exp. #168.]

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For All Your Graphic Needs *http://www.concentric.net/~robb6093* [Exp. #168.]

Fortney Associates, Inc. *http://www.fortneyco.com* Obtain governmental approv-al of your development project in a timely, cost-effect-ive manner. [Exp. #168.]

Fund Raising And More *http://www.angelfire.com/biz/Fundraising/index.html* We are offering a wonderful fund raising item in the form of grocery coupon certificates. [Exp. #168.]

Galaxy TeleCards *http://wwwn.netcom.com/~rdrodrig* Information regarding free $0.19/ minute rechargeable phone cards and home-based business distributorship opportunities. [Exp. #167.]

Gallucci's Italian Foods *http://www.tasteitaly.com* Importer of fine Italian gourmet and Hungarian foods and wines since 1912. [Exp. #168.]

Geofax *http://geofax.net* Allows people to get their voicemail and fax messages over the Internet as well as listen to their messages, faxes, and email over the phone. [Exp. #167.]

Gift Basket Place *http://www.giftbasketplace.com* Winnie and Lorrie are bringing country values to electronic markets. [Exp. #168.]

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Jaz's Secret *http://www.fred.net/congo/secret.html* Simple the best Bar-B-Q sauce. Money-back guarantee. [Exp. #166.]

Jet Enterprises *http://home.earthlink.net/~ladyjet* Corporate and personal services: Organize events, seminars, parties, reunions, travel. Project sitting. Procurement. Compile data. [Exp. #167.]

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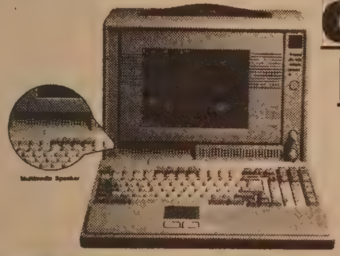

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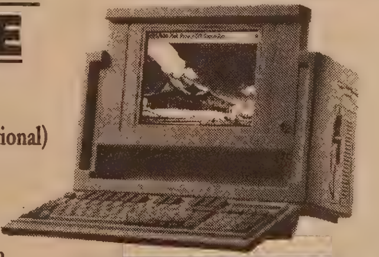

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Web Page Listings *continued...*

Lavender Pages *http://www.lavenderpages.com/* The largest gay shopping mecca on the Internet—Shop the Castro from the comfort of your own keyboards. [Exp. #168.]

Lighthouse Professional Group *http://www.lhpg.com* Small business consultants' page offering tips on computers and property management. [Exp. #167.]

Logistics Consulting Group, Inc. *http://www.lcgrp.com* Atlanta-based management consulting firm. [Exp. #168.]

Madely's Collectables & Things *http://members.aol.com/madelys/index.htm* Porcelain dolls and resin figurines. [Exp. #168.]

Mansoor's Imports *http://www.amarna.com/eir/imports/html.htm* Edgard and Maj-Gun Mansoor's antique store in San Juan Capistrano, CA. [Exp. #166.]

Opamp Labs, Inc. *http://www.opamplabs.com* Mfg. of amplifiers, multimedia press-boxes, audio transformers, and industrial electronics. [Exp. #166.]

PCB-Quote, Inc. *http://www.pcb-quote.com* Free multiple quote for PCB layout, fabrication, assembly. Over 250 PCB vendors to choose from. [Exp. #168.]

Porta Gas, Inc. *http://www.portagas.com* Calibration gases and equipment for air monitoring equipment. [Exp. #168.]

Posie Peddler Florist *http://home.earthlink.net/~samson/posie.htm* Specialty roses, fruit and gourmet baskets, balloons, tropicals, exotics, worldwide delivery. Charge by phone. [Exp. #167.]

R.L. Schreiber OnLine *http://www.RLSchreiber.com* A family-owned and operated company since 1968 providing high quality food bases, spices, and related products. [Exp. #168.]

RBF Enterprises *http://www.rbfenterprises.com* We sell discount cigar humidors. Visit our site for more information. [Exp. #168.]

Saudi Arabian Development Company *http://www.sadco.com* Sales and services of industrial equipment, engineering and construction consultancy, and information technology group. Covering all of Saudi Arabia. [Exp. #168.]

Seiko Pool Co. *http://www.seikopools.com* One of the oldest and most respected builders in Southern California. [Exp. #167.]

Shotokan Karate Of America, Garden Grove, CA. *http://inwinc.com/2003/garden.htm* Events, National Dojo directory, class schedule. Info about the history of Shotokan Karate of America. [Exp. #168.]

SOSS Invisible Hinge *http://www.hinge.com* Provides the entire SOSS Invisible Hinges catalog. [Exp. #168.]

The Sound Wave *http://www.thesoundwave.com* Creators of original music and voiceovers for Web sites and multimedia mediums. [Exp. #166.]

SuperMarkets Online *http://www.supermarkets.com* A cooperative site for supermarkets and packaged good manufacturers bringing coupons, recipes, and more. [Exp. #166.]

TaCito Direct Marketing *http://www.tacito.com* Direct mail advertising. [Exp. #168.]

Team Simpson *http://www.simpsonraceproducts.com* America's leading manufacturer of motorsports products for racers, race teams, and fans. [Exp. #168.]

Thog, Inc. & Associates. *http://www.thog.com* [Exp. #168.]

Toy Time *http://www.toytime.com* Toy Time, an online specialty toy store, lets kids register for exactly what they want for their birthday. [Exp. #167.]

USSÁ, Inc. *http://www.catpass.com/ussa* Network marketing, home and small businesses, travel, and health. [Exp. #168.]

Ventura Design On Time, SA. *http://ventura.ch* A different breed of watches. [Exp. #168.]

The Very Best Sticker Company *http://members.aol.com/utcbob/tvb/tvb.htm* Catalog company featuring stickers for kids of all ages. [Exp. #167.]

Vimich Traffic Logistics *http://www.vimich.com* Contract traffic logistics management. [Exp. #168.]

FINANCIAL/ REAL ESTATE SERVICES

George E. Thomas Real Estate Advisory *http://www.ziplink.net/~gthomas/* Provides advisory services to owners, lenders, and buyers of commercial real estate in California. [Exp. #168.]

Real Estate Service Review *http://www.rereview.com* Real Estate Service Review is a real estate and relocation service designed for consumers, agents, and businesses. An agent should be a choice, not a chance. [Exp. #168.]

LEGAL SERVICES

California Anti-SLAPP Project *http://www.sirius.com/~casp* Provides information on strategic lawsuits against public participation and California's anti-SLAPP law. [Exp. #168.]

Database Solutions, Inc. *http://members.aol.com/formfiler/homepage.htm* Developers of PhotoTracker Pro and Do-It-Yourself Divorce software. [Exp. #168.]

Law Offices of John R. Kahn *http://members.tripod.com/~jkahn/index.html* Attorney handling Computer, Bankruptcy, and Real Estate law, and transactional matters in San Jose, CA. [Exp. #167.]

Legal Survival Web Site *http://www.friran.com/* Robert Friedman, of Friedman & Ranzenhofer, presents the law in easy to understand lay terms for consumers and small business owners. [Exp. #167.]

Richard J. Greenstone, Attorney at Law *http://www.rjg.com/rjg* Copyright, trademark, licensing, business, and transactional law for the computer, entertainment, and publishing industries. [Exp. #166.]

Silicon Valley Legal Net *http://www.pagedepot.com/siliconvalleylegalnet* Interactive legal and business Web site. [Exp. #168.]

EMPLOYMENT/ EDUCATION

Adgrafix *http://www.adgrafix.com/info/aprice/sales.html* Account executives needed. High commissions and no investment. [Exp. #167.]

Avant-Garde Executive Recruiters *http://www.avgard.com* Executive and senior engineering search and placement firm. [Exp. #168.]

Crash Course On The Internet *http://www.choicemall.com/crashcourse* A five hour video training series by NASA Internet specialist Brian Kowal. [Exp. #168]

The Desktop Writing Workshop *http://www.writingshop.com* Interactive multimedia fiction writing tutorials on CD-ROM. Award-winning author/ teacher Tom Parker plus e-Critiques. [Exp. #167.]

Extreme Training Methods *http://inwinc.com/2003/extm.htm* Increase your mind-body skill levels by 400%. Break through mental, physical plateaus and blocks. [Exp. #168.]

Hart Crowser Online Institute *http://www.supportonline.com* Provides computer-mediated, instructor-moderated, learning to support the training and education of today's workforce. [Exp. #168.]

Human Resource Network *http://www.hr-network.com/* IT contract and recruitment services. [Exp. #168.]

Implant Dentistry Communications *http://www.implantdentistry.com* Offers patient education about the surgical and prosthetic phases of this treatment. [Exp. #166.]

The Learning Annex *http://www.thelearningannex.com* Interactive seminars, online store, student cafe/forum, listing of live seminars, and future celebrity seminars and chat. [Exp. #167.]

Pacific College Of English *http://pacificcollege.edu.au* [Exp. #168.]

Raising Capital Seminar *http://www.altosnet.com/* World's first online seminar on raising capital. [Exp. #167.]

Zephyr Business Services *http://members.aol.com/zephyrbus/web/* Computer software training specializing in speech recognition software and custom training. Sales and support of major speech recognition platforms. [Exp. #168.]

ORGANIZATIONS

Association To Benefit Children *http://www.a-b-c.org* Founded in 1986 to fight against the numerous threats children face every day: poverty, homelessness, drug addiction, and HIV. [Exp. #168.]

Bright Futures Project *http://www.brightfutures.org* Bright Futures mission is to promote and improve the health and education of children, families, and communities. [Exp. #168.]

The Center For Group Learning *http://www.cgl.org/* Learn about theories and practices regarding (people) group dynamics—workshops, conferences, links, online material, etc. [Exp. #167.]

CHECNet *http://www.checnet.org* The communication hub for individuals, organizations, scientists and policy-makers interested in children's environmental health. [Exp. #168.]

European Train Enthusiasts *http://www.ete.org* Railroads of Europe, including modeling, travel video and photography, collecting, swapping, and modular railroading. [Exp. #167.]

Future Media *http://www.futuremedia.org* News, reviews, and attitudes on new media. [Exp. #167.]

Get Involved Online *http://www.stc-inc.org* AIDS awareness and prevention site sponsored by Students That Care, Inc. [Exp. #168.]

LA AutoCAD User Group *http://www.lacad.org* Supporting the Autodesk family of software. Lisp programs, calendar of events, member/meeting information, articles, and technical papers. [Exp. #168.]

National Center For Employee Ownership *http://www.nceo.org/* Readings, columns, discussions, and interactive training on employee stock ownership plans, stock options, etc. [Exp. #167.]

National Trust For Historic Preservation *http://www.nationaltrust.org* News fresh from preservation's front lines, reports from the field, updates on legal battles, links, and a discussion forum on preservation topics of the day. [Exp. #167.]

Northern California Power Agency Home Page *http://www.ncpa.com* Electric power provider located in Northern California. [Exp. #168.]

Orange County NetWare Users Group *http://www.computerquest.com/cns/ocnet/* Web site that lists meeting topics, dates, and membership info. [Exp. #168]

San Francisco PC User Group *http://www.sfpcug.org/* Open to all persons interested in solutions to problems related to the use of Intel x86 and compatible computers. [Exp. #167.]

San Gabriel Valley Chiropractic Society *http://home.earthlink.net/~bacdoc/sgvcs.htm* A Southern California branch of the California Chiropractic Association, with information and email addresses of the members. [Exp. #168.]

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- Stealth Video 2500 PCI 2MB EDO
- 12X EIDE CD ROM Drive
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- Logitech 2-button serial mouse
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** Please call store for laptop's warranty information*

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256k Pipeline Burst Cache
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Mini Tower Case w/200watts PS
Logitech 3-button Serial Mouse
Microsoft® Windows 95 (OSR2)

$699

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ATX Multimedia System

Intel Tucson i430HX motherboard (ATX)
256K Pipeline Burst Cache
CPU Heatsink & Cooling Fan
Intel 133MHz Pentium processor
16MB 60ns EDO Ram (Exp. 128MB)
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Enhanced PCI IDE Controller
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12X EIDE CD ROM Drive
Yamaha 3-D SRS sound (built-in)
Maxi Switch 104 Keyboard PS/2
Medium Tower Case (ATX) w/PS
Logitech 3-Button PS/2 Mouse
Yamaha YST-M15 Stereo Speakers
Microsoft® Windows 95 (OSR2)

$999

*Add $20.00 for AMD K5-PR166

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256K Pipeline Burst Cache
CPU Heatsink & Cooling Fan
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Enhanced PCI IDE Controller
ATI 3D Expression 64 PCI 2MB
12X EIDE CD ROM Drive
Sound Blaster 16 PnP
Fujitsu 104 Enhanced Keyboard
Premium Mid Tower Case w/PS
Logitech MouseMan serial mouse
Yamaha YST-M7 Stereo Speakers
Microsoft® Windows 95 (OSR2)

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20-25% Faster

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Pro Workstation

Intel Venus 440FX motherboard
Intel 180MHz Pentium® Pro processor
Built-in 256K L2 Cache
CPU Heatsink & Cooling Fan
32MB EDO RAM (Exp. to 128MB)
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3.0Gig EIDE Hard Drive
Enhanced PCI IDE Controller
Lightspeed 128 PCI 2.25mb MDRAM
16X EIDE CD ROM Drive
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Premium Mid Tower ATX Case w/PS
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64MB EDO RAM (Exp. to 128MB)
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3.2Gig Ultra SCSI Hard Drive
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Matrox Millenium 4MB VRAM
12X SCSI-2 CD ROM Drive
3Com 100mbps PCI NIC
Fujitsu104 Enhanced Keyboard
Premium Mid Tower ATX Case w/PS
Logitech 3-button PS/2 mouse
Microsoft® Windows NT Workstation 4.0

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ACCESSORIES

3M Travan TR-1 800MB for T1000	$25
3M Travan TR-3 3.2Gig for T3000	**$24**
3M Travan TR-4 4Gig for T4000	$39
SONY QW3010XLF 850MB	$15
Juster SP-868 Stereo speakers	$29
Juster Subwoofer	$72
Yamaha YST-M7 Speakers	$45
Yamaha YST-M15 Speakers	$85
F-002 Stereo Headphones	$3
PX-924 Stereo Headphones	$14
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Ball bearing 586 CPU heatsink & fan	$12
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CD ROM DRIVES

Acer 12X IDE	$85
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CyberDrive 12X IDE	$79
CyberDrive 12X SCSI-2	$129
FUNAI 8X/16X IDE	$75/115
Mitsumi 8X/12X/16X IDE	$79/87/99
Nakamichi 4X4 IDE CD changer w/controller	$78
NEC 8X IDE	$90
NEC 8X SCSI-2 Caddyless	$165
Pioneer 12X IDE	$79
Teac 8X/16X IDE	$78/99
Toshiba XM-5702B 12X 125ms 256k	$85
Toshiba XM-3701 12x SCSI-2 256k	$149
Toshiba XM-3801 15X SCSI-2 <99ms 256k	$165
***** RECORDABLE CD ROM DRIVE *****	
RICOH 2x(write)/4x(read) 1MB cache	$Call
RICOH Rewritable Drive	$Call
SONY 2x(write)/4x(read) 1MB cache	$Call
HP SureStore CD-Writer 6020 2x/6x	$469

CONTROLLERS

adaptec AHA-2940 SCSI-2 w/kit	$145
adaptec AHA-2940au ultraSCSI w/kit	$165
adaptec AHA-2940uw ultraWide SCSI w/kit	$199
adaptec AHA-3940/3940w	$call
FirePort 40 (by DIAMOND) ultraWide SCSI (retail)	$159
SC-200 (Symbios) fastSCSI [for ASUS mb only]	$68

DISPLAY ADAPTERS

#9 Motion 771 PCI w/2MB VRAM	***$89***
#9 Imagine 128 PCI 4MB/8MB	$479/629
ATI 3-D Expression PCI 2MB EDO	$75
ATI 3-D Expression PCI+PC2TV 4MB EDO	$125
ATI Winturbo PCI w/2MB VRAM MPEG	$165
ATI all-in wonder TV/Video 2/4MB PCI	$Call/239
MGA Matrox Mystique 2/4MB SGRAM PCI	$89/135
MGA Matrox Millenium 2/4MB WRAM PCI	$149/199
ORCHID Kelvin 64 PCI 1MB /Video	$79/95
STB Lightspeed 128 Video PCI 2.25MB MDRAM	$99
S3 Trio64 PCI SVGA (by ExpertColor) 1MB EDO	$35
Stealth 64 PCI Video 2001 1MB DRAM	$65
Stealth 3-D 2000 2MB/4MB EDO RAM	$79/99
Stealth 3-D 2000 PRO 2MB (35ns) EDO RAM	$95
Stealth Video 2500 PCI 1MB EDO	$39
Stealth 3-D 3000 2MB/4MB EDO VRAM	$119/169
Stealth 64 Video PCI 2MB/4MB VRAM	$125/165

HARD DRIVES

Fujitsu 1.27/1.7gig EIDE	$179/195
Fujitsu 2.1/2.5gig EIDE	$209/235
JTS 1.08/1.2/1.6	$Call
JTS Champion 2.0Gig EIDE	$186
JTS 3.0Gig	$Call
MAXTOR 2.0/2.7Gig EIDE 11ms	$199/235
MAXTOR 5.2Gig EIDE	$399
Micropolis 9Gig UltraWide	$Call
Quantum 1.27Gig EIDE (Bigfoot)	$162
Quantum 1.2/1.7Gig EIDE 12ms 128k	$179/195
Quantum 2.1/3.8Gig EIDE 12ms 128k	$209/315
Quantum 3.2Gig Ultra SCSI	$302
Quantum Atlas 2Gig Wide SCSI	$Call
Quantum Atlas 4.3Gig Wide SCSI	$Call
Seagate 1.27Gig EIDE	$182
Seagate 1.6/2.1Gig EIDE	$185/208
Seagate 2.5/3.2Gig EIDE	$219/289
Seagate 4.2Gig EIDE (ST-34250A) 10.5ms	$Call
Seagate 2.1Gig UltraWide SCSI	$Call
Seagate 4.3Gig UltraWide SCSI	$799
WD 1.27/1.6Gig EIDE 10ms	$189/195
WD 2.0/2.5Gig EIDE 12ms	$209/225
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Logitech Serial 2-Button (Dexxa)	$7
Logitech Serial 2-Button (M34)	$11
Logitech Serial/PS2 3-Button	$15
Logitech MouseMan combo 3-Button	$25
Logitech TrackMan Marble (combo)	$79
Logitech MouseMan Bus Mouse 3-Button	$44
Logitech WingMan Extreme Joystick	$29
Mitsumi 2-Button Serial/PS/2	$10

MODEMS

Internal 14.4k Faxmodem w/Voice Mail	$25
Jaton (made in USA) 33.6k Int. Faxmodem	$62
MAXTECH 33.6k V.34 Faxmodem/with voice	$85/99
Modem Blaster 28.8k Int. Faxmodem	$62
Motorola 28.8k faxmodem Int./Ext.	$139/call
miro Media Online 33.6k + SC w/wave + voice	$75
Practical Peripheral 28.8k Internal Faxmodem	$159
SupraExpress 33.6k PnP w/Voice Int. (retail)	$65(85)
Supra Netcommander ISDN Int.	$259
USR Sportster 33.6k V.34 /voice Int (upg. 56K)	$93/105
USR Sportster 28.8k V.34 voice Ext	$129
USR Sportster 56k Int/Ext (retail)	$179/199

MOTHERBOARDS

ASUS VX97 430VX Intel chipset 512k	$105
ASUS 430VX/HX Intel chipset 512k	$133/139
ASUS 430TX Intel chipset 512k TX97/X	$Call
ASUS 430TX Intel chipset 512k TX97-E w/fan	$189
ASUS 430TX Intel chipset 512k TX97-XE w/fan	$185
ASUS 440FX Intel chipset Pro	$Call
A.I.R. 430HX Intel chipset 256K	$155
A.I.R. 430HX w/ultraWide SCSI built-in 512k	$329
Intel Marl 430HX 256k	$115
Intel Tucson 430HX + yamaha SRS sound 256k	$155
Intel Venus 440FX PRO	$189
Intel Providence Dual PRO + SC & NIC	$575
Intel Portland Pentium II + Yamaha sound	$299
586PCI 430VX chipset 256/512k (jumperless)	$92/109
Supermicro P5STE (made in USA) 512K	$175
TMC 430TX (TI5TT) Intel Chipset 512k	$155
TMC 440FX (TI6NFK) Pentium Pro/Pentium II	$249
TMC 440FX (AI6NF) Pentium Pro AT	$195
TMC 440FX (TD6NF) Dual Pentium Pro ATX	$299
Tyan TITAN Turbo - Triton TX (AT or ATX)	$149
Tyan Tomcat I 430HX 512k	$189
Tyan Tomcat II 430HX Dual 512k	$245
Tyan TITAN PRO 440FX Dual PRO ATX/AT	$299/339
Tyan TAHOE AT -S1680S Pentium II	$319
Tyan TAHOE 2 ATX -S1682D Dual Pentium II	$375

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Iiyama Vision Master Pro 17 (1600x1280) .25AG	$759
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MAG DX1595 15" .28 NI (1024x768) Digital	$365
MAG DX1795 17" .28 NI (1280x1024) Digital	$609
NEC (ALL Models, Please Call)	$CALL
Sampo 14" NI .28 (1024x768) Digital control	$179
Sampo 15" NI .28 (1280x1024) Digital control	$259
Sampo 17" NI .28 (1280x1024) Digital control	$475
Smile 17" NI .28 (1280x1024) Digital OSD	$475
SONY 100SX 15" (1280x1024) .25 Digital	$369
SONY 200SF ii 17" (1280x1024) .25 Digital	$739
SONY 17se2 17" (1600x1280) .25	$899
ViewSonic 15GS (1280x1024) .28 NI	$345
ViewSonic 17GS (1280x1024) .27 NI	$575
ViewSonic 17GA (1280x1024) .27 NI w/Spkrs	$665
ViewSonic 17PS (1600x1280) .26 NI	$689
ViewSonic PT770 (1600x1280) .25 NI	$779
ViewSonic PT775 (1600x1200) .25AGP 17"	$Call
ViewSonic PT813 (1600x1200) .28AGP 21"	$Call
ViewSonic P810 (1600x1200) .26 NI 21"	$Call
ViewSonic P815 (1800x1600) .26 NI 21"	$Call

NETWORKING

3COM EtherLink III TPO/TP/COMBO	$69/83/92
3COM EtherLink III PCI 10/100Mbps	$79
Intel EtherExpress Pro10+ ISA	$85
Intel EtherExpress PRO/100 PCI	$95
5-port HUB	$65
LanPro 16-port HUB	$199
Maxtech 16-port HUB	$229
NE-2000 16-bit TPO/COMBO ISA PnP	$25/29
SMC EtherLink III TPO/TP/COMBO	$69/89/109

PRINTERS

Epson Stylus Color 600	$299
Epson Stylus Color 800	$429
HP Inkjet 400	$169
HP Inkjet 694/820Cse, 6 5ppm (black), 4ppm (color)	$299/299
HP Inkjet 870Cse, 8ppm (black), 4ppm (color)	$389
HP LaserJet 5L eXtra 600dpi 6ppm, 1MB Memory	$369
HP LaserJet 6P 600dpi 8ppm	$Call
HP LaserJet 6MP 600dpi, 8ppm PostScript	$899

SCANNERS & OCR READERS

HP ScanJet 5p Scanner	$399
HP Scanjet 4c Scanner	$899
Musktek ScanMaker E6	$369
PaperPort Vx (Visioneer)	$199

SOUND CARDS

ESS 1868 16-bit 3D EIDE int.	$19
ExpertColor 3-D 16-bit (OPTI 931) full duplex	$19
miro Media Online SC + Wave + 33.6k voice	$75
PowerSound Vibra 16 w/FM Radio EIDE int.	$72
SoundWave 32Pro +SCSI w/WaveBooster	$125
Sound Blaster 16 MCD w/ASP (non-PnP)	$89
Sound Blaster 16 PnP/32 PnP 3-D	$55/99
Sound Blaster AWE32 3D PnP (retail)	$199
Sound Blaster AWE64 Value (retail)	$95
Sound Blaster AWE64 (retail)	$179
Sound Blaster WaveBlaster II (retail box)	$75
TeleVideo SoundWave SRS w/Wave + Mech II	$99

TAPE BACKUP

Colorado T3000 1.6/3.2Gig Travan	$199
FC-20 controller for T1000/T3000	$68
Colorado T4000 4Gig/8Gig SCSI-2	$369
Conner 4Gig IDE/SCSI internal w/tape	$245
Iomega Ditto 2000 2.0Gig (Int/Ext)	$169/199
Iomega Ditto 3200 3 2Gig (Int/Ext)	$219/270
Iomega Zip IDE(oem)/parallel/SCSI	$149
Iomega Jaz Internal(oem)/External	$349/489
Iomega Jaz Traveler (Parallel to SCSI adapter)	$49
Zip Disk (100MB)	$14
Jaz cartridge (1gig)	$109
SyJet 1.5Gig Removable <12ms Ext.	$459

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Internet Explorer
FREE Web Page
No Set-Up Fee
$39.99/mo.

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e-mail SALES@HYPERSURF.com

Web Page Listings *continued...*

Santa Clarita Valley's PC Group *http://www.smartlink.net/~scvpcg* The Santa Clarita Valley's PC Group dedicated to PC literacy. Come join us. [Exp. #167.]

Sapient Health Network (SHN) *http://www.shn.net* An interactive health information service developed for people with chronic and serious illnesses. [Exp. #168.]

Share International *http://www.shareintl.org* Shows the synthesis underlying the political, social, economic, and spiritual changes now occuring worldwide. [Exp. #166.]

Software Forum *http://www.softwareforum.org* Building success for professionals. [Exp. #168.]

Veterans Memorial Senior Center *http://members.aol.com/VMSC CompEd* Redwood City Senior Center featuring its activities including computer education. Also links to significant sites. [Exp. #166.]

WCG-North Bay Churches *http://pages.prodigy.com/YJCN61A/winewood.htm* Worldwide Church of God north of the Gate. Bilingual Web site, English and Spanish. [Exp. #167.]

PUBLICATIONS

111 Xcentrix Zine *http://www.best.com/~xcentrix* On the Web since 1995. Art, fashion, gossip, film, books, and music. [Exp. #168.]

El Grupo ¡Ea! *http://www.grupoea.org* El Grupo ¡Ea!, es un canal de informacion que viene a develar los secretos que estan sellados hermeticamente en el Libro de la Vida, para estos días en que se cumple la profecia del fin-de-los-tiempos. [Exp. #168.]

The Free Web Page Provider Review *http://www-leland.stanford.edu/~maxlee/FWPReview/* [Exp. #166.]

Global Production Network *http://www.gpn.net* An international directory of resources for the film industry. [Exp. #168.]

MassageMall *http://www.MassageMall.com* A directory of massage therapists. [Exp. #168.]

Microwave News *http://www.microwavenews.com* A report on non-ionizing radiation. [Exp. #168.]

OPAMP Technical Books *http://www.opampbooks.com* Computers, engineering, business, trades, 20,000+ titles listed, 5% discount. [Exp. #168.]

Puerto Rico Online Magazine *http://www.prmag.com* Your entertainment guide for Puerto Rico. [Exp. #168.]

Virtual Vegetarian *http://www.vegetariantimes.com* Developed by the editors of *Vegetarian Times*, the site features recipes, advice on health and diet issues, resources, upcoming events, and more. [Exp. #167.]

writers.net *http://www.primapublishing.com/life/7615064.1.html* Comprehensive guide to 750+ online resources as well as opportunities for writers and readers. [Exp. #168.]

ODDS & ENDS

AirCal *http://members.aol.com/aircal737/reunion.htm* Information about the upcoming AirCal reunion, a great airline once based in Orange County. [Exp. #166.]

Awareness Holistic Books & Information Center *http://www.netwizards.net/~awareness* A meeting place for creative evolution of body, mind, and spirit in San Mateo. [Exp. #168.]

B737 Club *http://home.worldonline.nl/~pvheyst* Information about B737 destinations for KLM cockpit- and cabin-crew. Also information about the EF2000 simulation. [Exp. #168.]

Belgian Dental Site *http://www.belgiandentalsite.com* This is the first Belgian dental site for dentists, dental labs and patients. [Exp. #168.]

Claris Small Business Web Site *http://www.claris.com/smallbiz* Features a valuable collection of information, services, software templates, demos, and other resources to meet the needs of small business owners. [Exp. #167.]

Egypt Interactive *http://www.amarna.com/eir* A listing of Egyptology, archaeology, and museum-related Web sites. [Exp. #166.]

F12 Online Anonymous Twelve Step Program *http://www.apc.net/ia/index.htm* Webaholics, netaholics, modemheads, interholics, and newsgroupies are welcome. Satirical support site dedicated to working the 12 keys. [Exp. #167.]

Healthcare Forums *http://www.healthcareforums.com* Web-based community allows global interaction among doctors, nurses, allied health professionals, and industry vendors. [Exp. #168.]

New Ways *http://www.icafe.com/nways/hazward* [Exp. #168.]

Romance Club Online *http://www.romanceclub.com* The ultimate place to meet fine quality and attractive singles. [Exp. #168.]

Sunshine International Penpals *http://sunshine-girls.com/* Asian women desire romance, marriage. World's largest correspondence service since 1984. Free photo brochure. [Exp. #168]

The Lunitic Legion *http://www.concentric.net/~tmnt/* A group of hackers and Phreaks. [Exp. #168.]

Vacuum Tube Valley *http://www.vacuumtube.com* Info on tube audio, guitar amps, tube computers. Also featuring classified ads and articles on VTV. [Exp. #167.]

Washington Economics Intelligence Brief *http://www.weg.com* An incisive weekly accessment of US economic developments and Washington policy for corporate decision makers and investors. [Exp. #168.]

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- Mouse
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Pentium®-200MMX ..$1695

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Quantum	2.0GB/3.0GB SCSI	$229/$319
	6.0GB IDE	$509
IBM	2.0GB/4GB SCSI/UW	$389/$585
Fujitsu	4GB SCSI/UW	$749
Seagate	4GB SCSI/UW	$809
Iomega	Zip 100	$149
	Jaz 1.0GB Int/Ext	$289/$379
Syquest	EZ-235 Ext.	$239
Colorado	T3200 Int/Ext	$169/$199

CONTROLLERS

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Promise	Enh IDE&IO	$49

SCANNERS

HP	ScanJet 5P/4C	$385/$695
	ScanJet 5S	$249
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MONITORS

MAG	DX15/DJ700	$369/$569
Viewsonic	14" EG41/15" E655	$239/$329
	17" 17GS/17" PT770	$579/$695
	21" P810/21" P815	$1395/$1629
Sony	15" 100SX/100SF	$369/$429
	17" 200SX/200SF	$649/$749
NEC	C500/XV17+	$389/$679

PRINTERS

HP	820C	$295
	692C/870C	$299/$385
	6L/6P	$389/$749
	5/5Si	$1249/$2719
Epson	Stylus Color 600	$279
	Stylus Color 800	$429
	Stylus 1500	$669

VIDEO BOARDS

ATI	Graphic Xpr	$189
	WinTurbo 2MB	$209
Diamond	Stealth 2MB DR	$79
	Stealth 2MB DR 3D	$89
	Stealth 2MB VR	$139
	Stealth 2MB VR 3D	$179
Matrox	Millennium 2MB/4MB	$169/$219
	Mystique 2MB/4MB	$99/$139

MULTIMEDIA

Creative	SB 16/32 PnP	$69/$99
	AWE 64 PnP	$155
	Discovery 12X AWE 64	$279
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Mitsumi	12X CD-ROM	$99
	16X CD-ROM	$129
Toshiba	12X CD-ROM IDE	$99
	12X CD-ROM SCSI	$149
Panasonic	8X CD-ROM SCSI	$139
	24X IDE	$169
NEC	12X CD-ROM SCSI	$149

FAX/MODEMS

Hayes	33.6 Int/Ext	$125/$145
Megherz	33.6 PCMCIA	$199
Supra	33.6 Int/Ext	$89/$135
US Robotics	56 Int/Ext	$175/$195
Motorola	56 Int/Ext	$145/$165

NETWORKS

CNet	NE2000 Combo	$29
3COM	3C509TPO/BNC	$59/$89
	3C509 Combo	$109
	3C900 PCI TP	$105
	PCMCIA TP	$145
	3C905 10/100 TPO	$75

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The Birth Of Spread Spectrum

continued from page 114

The system has been in operation for three years, and its developers believe that LATNET's experiences "should be of interest to networkers of developing countries where communications infrastructure is weak and wireless communications are not over-regulated. Wireless IP networking might be a cost-effective solution also in industrial areas of the world." Guntis Bardzdins and John Tully have published a paper describing LATNET's setup on the Web at *http://www.latnet.lv/latnet/radiolink/HTMLDocument.html*.

Dave Hughes (*dave@oldcolo.com*) agrees. Well-known on the electronic frontier for his work to bring affordable Internet access to ethnically and economically marginalized communities, Hughes has received a National Science Foundation grant to investigate wireless Internet connectivity for rural education. He maintains the NSF wireless project test site that documents wireless Internet access projects in the US (as well as an archive of information about the Lamarr-Antheil invention) at *http://wireless.oldcolo.com* . Hughes' experiments in establishing affordable Internet access, both in public schools in rural Colorado and in Mongolia, have convinced him that spread spectrum is the technology to bring cost-effective Internet access to the far corners of the earth.

Hughes likes to point out that even today, one can access the Internet using a spread-spectrum radio at a T-1 level connection without incurring any telephone charges or monthly service fees, "just the cost of the radio."

Spread spectrum is affordable because for one thing, it makes spectrum plentiful. "The latest studies at MIT (Ph.D. Thesis by Tim Shepard, 1995) prove that *millions* of radios can operate simultaneously in the same space in metro(politan) areas. Which overcomes *the* main limitation of radio, which is that radios interfere with each other if they are in power range of each other," says Hughes.

With so much spectrum available, the current FCC practice of licensing specific bands of frequencies to specific corporate users is of questionable necessity. As Hughes pointed out to the FCC recently, it's simply not a cost-effective way to bring rural communities onto the Internet:

"Now that we have, for all practical purposes, an unlimited spectrum," exhorts Hughes, "let's get serious about using the 'public spectrum' for 'public purposes' like connecting up all 84,000 schools to the nearest POP (Point of Presence—an Internet node), and all fifty-five million students at home, plus three million teachers, to the school servers, free. Just buy the radios, not the services. And save the taxpayers—for the T-1 link from the schools only, about $16 million a month, which otherwise will go into the pockets of the telcos, whose 'right' to such income I really don't see in the Constitution."

For The Common Good

Once again, spread spectrum is in a position of potentially making a tremendous contribution to the public good. It's not exactly what Lamarr and Antheil had in mind when they invented the Secret Communications System, but, Anthony Loder says, his mother is glad that she "did something that could be good and useful for people, and for the country, and for the world."

And it has only taken 55 years for us to realize that the unlikely collaboration of a celebrated movie star and an avant-garde composer could possibly invent a communications system that is still at the forefront of telecommunications technology. ■

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Online Guide

Web Page Listings *continued...*

World Wide PenPal Service *http://www.yaya.com/* Find you pen pal (e-pal) world wide. Post your pen pal ad free. [Exp. #166.]

Yoga & Menopause *http://www.HotflashYoga.com* Philosophy of Nevine Michaan and Katonah Yoga, designed to relieve symptoms of menopause, as seen on CBS TV, in English and Spanish. [Exp. #168.]

Your Free Clairvoyance *http://www.sara-freder.com/index_an.html* Whatever the problem might be that is ruining your life, you have absolutely nothing to pay neither before nor after your free clairvoyance consultation. [Exp. #168.]

PERSONAL HOME PAGES

AnthonyD's World And Scanner Service *http://users.aimnet.com/~tonydd/htmlpage/welcome.html* Learn how to create your own Web page with my scan service; law on the Net; free icons. [Exp. #167.]

Beedon's Better Bookmarks *http://www.netcom.com/~beedon/andcats.html* A huge selection of bookmarks and links covering topics such as computers, sports, business, etc. [Exp. #168.]

Bruce Kremer Home Page *http://wwwbcf.use.edu/~bkremer* Drawings and travel journal entries. Art from sketchbooks and diaries, originals suitable for exhibition or publishing. [Exp. #167.]

Cotteg In Moscow *http://old.relis.ru:80/datum/RLine/mr021000.htm* [Exp. #168.]

Elmer Bergman, CPA *http://members.aol.com/BergmanE* Interesting accounting, tax, investment, computer, travel, search engine, address, goverment, and misc. links. [Exp. #166.]

Henry's Astrology Page *http://www.geocities.com/Heartland/Plains/8894* Find details about your astrological sign and who you are best compatible with. [Exp. #167.]

Joe's Secret Stash *http://www2.netcom.com/~aguilarj/secretstash* A virtual rest area for net surfers, including links and images of the Philippines and Hawaii. [Exp. #168.]

Kelvin's Domain *http://members.tripod.com/~KJiang/index.html* Anime and Manga picture site. Soon to be filled with Japanese animation. [Exp. #168.]

Lee's Home Page *http://www.geocities.com/SiliconValley/Pines/8849* An eclectic site with a surf theme. Links to surfing, weather, software, HTML authoring, law and other interesting sites. [Exp. #167.]

Paul Chow Homepage *http://www.rtcs.com/paul/* Read the story about Paul Chow; Chinese-American dedicated to honoring the Angel Island Immigrants. [Exp. #167.]

Phantom's Lair *http://www.jsnet.com/phantom* Enter any of three worlds: Vietnam War-era 8th Tactical Fighter Wing's Wolf Pack, My World of Macaws, or Corvette Club Home Page. [Exp. #167.]

Refrigerium Early Christian Web Site *http://www.hooked.net/~bless/refrigerium/index.html* An entry point for Early Christian (<500 c.e.) resources on the Internet. [Exp. #167.]

Richard Burnett's Home Page *http://pages.prodigy.com/YJCN61A/bur nett.htm* Personal page that includes biography and curriculum vitae for Bay Area recruiters. [Exp. #167.]

Ted Alvy Cosmos Topper Home Page *http://pages.prodigy.com/FNJD74A* Mallard, Captain Beefheart, Little Feat, Neon Park, Firesign Theatre, and more. [Exp. #167.]

XcraniumX *http://pages.prodigy.net/xcraniumx/index.html* Come to XcraniumX for Mp3 Music, Warez, and help with html. [Exp. #167.]

GOVERNMENT/ POLITICS

Corporate Watch *http://www.corpwatch.org* As all the Fortune 500 companies jump onto the World Wide Web bandwagon, who's keeping an eye on them? Corporate Watch is! [Exp. #167.]

Health Finder *http://healthfinder.gov* Designed to provide consumers with easy access to the widest range available of online, accurate, up-to-date health information from the US government and its many partners. [Exp. #167.]

Library Of Congress Information Bulletin *http://www.www.loc.gov/loc/lcib* [Exp. #168.]

Political Ecology Group *http://www.igc.org/peg* PEG is a multi-racial, volunteer-based organization working for environmental justice in the SF Bay Area. [Exp. #168.]

ARTS

The Cannonball Express *http://www2.best.com/~canonbal/* A video project-in-progess about urban firestorms, landscaping, and environmental issues. [Exp. #167.]

The E-Wall *http://www.geocities.com/SoHo/ 3672/* A virtual wall on which you are invited to hang a piece of your own art work. [Exp. #166.]

Photos By Lucia *http://home.earthlink.net/~Lucia/* Need a great photographer at reasonable prices? Check out the site of LA lenswoman Lucia. [Exp. #168.]

ENTERTAINMENT/ LEISURE

44 Non-Stop Tour *http://www.44tour.com.br* Learn more about Rio de Janeiro and Brazil, download pictures and Brazilian sounds. [Exp. #166.]

continued on page 201

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Bundles	**C1599**	**C1554**
w/Arcserve 6 Workgroup	$1,728	$2,421
w/Arcserve 6 Enterprise	$2,484	$3,177
w/Arcserve 6 Single Svr NT	$1,818	$2,511
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Order Cheyenne Arcserve v6.0 for NetWare Enterprise Edition for $350 off of ad price!

10 Base-T Twisted Pair Ethernet

3COM 3C509TP ISA Single/ 5-Pk/20-Pk	110/470/1,718
3C509B-TP0 Single/5/20-Pk	66/316/1,601
3C509B TP&BNC/5/20-Pk	84/398/1,974
3C529B TP/ MCA/5-Pack	244/1,026/5,661
3C592-TP0 EISA/5-Pack	210/832
3C592 EISA Combo/5-Pack	230/916
ADAPTEC ANA-6904 10BTX PCI 4-Port	497
INTEL EE Pro/10+ w/o Flash TP/5-Pk	81/359
EE Pro/10+ w/o Flash 20-Pk/80-Pk	1,324/4,495
SMC EtherEZ 10BT Single/5Pk	93/390
EtherEZ 20-Pk/50-Pk	1,387/3,086
EtherEZ Combo/5Pk/20Pk/50Pk	118/521/1,801/4,011

Fast Ethernet 10/100 MegaBit Cards

3COM 3C515 Etherlink 10/100 ISA Single/5-pk	173/827
3C515 Etherlink 10/100 ISA 20-pk	2,920
3C905TX Etherlink XL 10/100 PCI Single/5-Pk	97/455
3C905TX Etherlink XL 10/100 PCI 20pk/60pk	1,700/4,902
3C597 10/100BaseT EISA/5-Pk	265/1,262
ADAPTEC ANA-6944A/TX 100BTX PCI 4-Port	829
AsanteFAST 10/100 PC & MAC PCI/5-Pk	202/970
FARALLON PN990 NUBUS/PN994 PCI	245/140
INTEL EExpress Pro 10/100 PCI/5-pk	87/414
EExpress Pro 10/100 PCI 20Pk/80Pk	1,560/5,634
EExpress Pro 10/100 EISA	260
EExpress Pro 100 PCI Server card/5pk	511/2,373
SMC 9432 PCI Single/5/20/50Pk	89/420/1,620/3,604

Fast Ethernet Hubs

3COM 3C250-TX/I 12 100 BASE TX Stackable Hub	1,226
3C16590 12-pt Dual Speed 10/100 Hub	1,226
3C16591 24-pt Dual Speed 10/100 Hub	1,933
ASANTE AsanteFast 12-pt 100 BaseT Hub	1,000
COMPAQ Netelligent 1000 100BaseTX 8-port Hub	824
Netelligent 1224 10/100 24 port Auto Sensing Hub	2,688
Netelligent 1124 24 port 100BaseTX Hub	1,536
DLINK Profast II 100BTX 8-pt/12-pt	550/1,014
INTEL Express Stackable Hub 12-pt 100T	1,560
Express Stackable Wkgp Bundle(1 Hub, 10 Cards)	1,708
Express 10/100 Stackable Hub 12-pt	1,135
Express 10/100 Stackable Hub 24-pt	1,766
SMC EZ Hub 100 8-pt 100BTX Hub	542
TIGERSTACK 100 12-pt 100BTX SMC5312TX	1,184
TIGERSTACK 100 24-pt 100BTX SMC5324TX	2,173

Token Ring

3COM 3C319 TokenLink Velocity Single/5-Pk	199/940
3C339 Tokenlink Velocity PCI TR Single/10-pk	230/1,830
IBM Auto TR 16/4 Type 3 Single/5-pk	256/1,235
INTEL Token Express Pro 16/4 ISA	277
PROTEON P1394+ Token Ring 16/4/10-Pk	232/2,280
SMC Token Ring Elite 16/4 Single/12-pack	220/2,431
Token Ring Elite passive MAU 8-PT/16-PT	400/608

PCMCIA/Card Bus/Parallel Port Adapters

3COM 3C589C PC Card 10BT/COMBO.	143/197
3C689 PC Card TR/5-Pk	366/1,773
3C562 PC Card Enet 33.6 Modem/Fax/5-Pk	332/1,562
3C575-TX PC Card Fast Etherlink XL 10/100	156
3C575-TX PC Card Fast Etherlink XL 10/100 5PK.	780
IBM PC Card Coax/TP Adapter	242/261
PC Card Token Ring 16/4 Adapter	365
INTEL EtherExpress Pro/100 Mobile 16-BIT	172
EEPro/100 Mobile 16BIT 5PK/20PK	816/3,013
EEPro/100 Mobile 32BIT SINGLE	198
EEPro/100 Mobile 32BIT 5PK/20PK	902/3,350
XIRCOM Pocket Adapter III 10BaseT	291
Pocket ENET III COMBO(BNC & 10BaseT)	325
PC Card IIPS 10BaseT/Combo/TR	150/186/378
PC Card Enet 33.6 Modem & Fax 10BT/Combo	340/380
Card Bus 10/100BTX (CBE-10/100BTX)	199

Ethernet Hubs/Concentrators

3COM SuperStack II Entry Hub 12/24	278/431
OfficeConnect 16 TP, 1 BNC	259
SuperStack II PortSwitch Hub 12-pt/24-pt	995/1,457
SuperStack II Hub 10 12-pt/24-pt	533/859
SuperStack II Hub 10 48 ports	2,196
SuperStack II 10 Mgmt Module/Redundant PS	466/1,032
Office Connect 8-pt Hub TPO/TPC/TPM	127/159/397
SMC EtherEZ 8 port TP w/ BNC	99
ASANTE 8-Port w/AUI&BNC/12-Ports	122/242
24-Port w/AUI	390
BAY NETWORKS CG1001E01 BayStack 12-pt	595
CG1001E02 BayStack 24-pt	982
800 8-pt /2800A 16-pt	195/572
HEWLETT PACKARD AdvStack 8-port/16-port	169/486
AdvanceStack 12-pt/24-pt	455/862
AdvanceStack Switch Module for 12-pt or 24-pt Hub	683
AdvanceStack Management Module	350
AdvanceStack w/Mgmt Module 12-pt/24-pt	533/938

Ethernet Switches

3COM SuperStack II Switch 1000 12 10BT,1 100BTX	1,715
SuperStack II Switch 1000 24 10BT, 1 100BTX	2,845
SuperStack II Switch 3000 12-pt 100BTX	4,671
SuperStack II Switch 3000 8-pt 100BTX	2,676
SuperStack II Switch 3000 5-pt 100BFX	6,022
SuperStack II Port Switch Hub 12-pt/24-pt	805/1,209
SuperStack II Desktop Switch 24TP,1 100BTX	1,700
OfficeConnect Switch 140 4-10BT,1-100TX	949
ASANTE ReadySwitch 4 RJ45, 1 Fast Ethernet	1,253
BayStack 301 22 10BT, 2 100BTX	2,727
BayStack 302 8-10BT, 1-100BTX	1,772
BayStack 350T 16PT 10/100BaseTX switch	2,723
CISCO CATALYST1900 24 TP,1-100BTX,1-100FX	3,525
CATALYST 1900 24 10BaseT,2-100BTX	3,133
HP AdvanceStack Switch208 8-10BT,1-100BTX	1,121
AdvanceStack Switch224 24-10BT, 1-100BTX	2,032
AdvanceStack Switch2000 12 100BTX	1,751
INTEL ES101TX 8 PORT 10/100 Switch	2,191
ES101MATX 2 PORT 10/100 TX module	1,439
NPI Nuswitch FE101 1-100TX, 1-10BT Switch	376
FE200TT 2 100BaseTX Full Duplex	232
FE200TF 1 100BaseTX, 1 ST Full Duplex	528
2-100TX, 10-10BT/1-100TX, 5-10BT	1,888/761
5-100TX 12-10BT	4,434
2-100TX, 24-10BT/6-100TX Full Duplex	1,360/1,523
SMC TigerSwitch 100, 8 port 10/100BaseTX switch	2,597
USR Total Switch 4 Slot Base System	659
Total Switch 8-pt 10BaseT module	904
Total Switch 2-pt 100BTX	1,438
100BaseFX module	1,887

Tape Backup Solutions

CHEYENNE ARCserve v6.0 NLM 10 Users.	271
ARCserve v6.0 WRKGRP-Up to 25/Over 25	400/1,156
Changer Option for ARCserve/Push Agent	423/300
Windows NT Agent for ARCserve	330
NetWare Svr Suite/Open File Agent for NetWare	632/426
SEAGATE Backup Exec 1 Server 25 Users	354
Backup Exec Single Server/NetWare Ent NLM	497/1,007
Backup Exec Autoloader Option	432
Backup Director NLM 1 SVR/Multi-Server	727/1,164
Storage Manager Single Server 25 Users	733
Storage Manager Single Server/Multi-Server	1,435/2,538
STAC Replica for NetWare/Multi-Server Option	419/713
EXABYTE 8205XL 8mm 3.5-7GB Drive Int/Ext	1,409/1,681
EXB-8700LT 8mm 7-14GB drive only	761
EXB-8700 8mm 7-14GB w/ Server software	1,127
HP C1554 DDS3 4mm 12-24GB DAT Int/Ext	1,415/1,565
C5647 72-144GB DDS3 autoloader	2,780
C1559 Surestor Ext 72-144GB DDS3 autoloader	3,641
C1536 DDS 4mm 2-4GB DAT Int/Ext	719/869
C1599 DDS2 4mm 4-8GB DAT Int/Ext	840/990
C1553 24-48GB Autoloader Int/Ext	2,230/2,530
SONY SDT-9000 4mm DDS3 24GB Int/Ext	1,102/1,138
SDT-9000 w/Arcserve Enterprise Int/Ext	1,860/1,884
TECMAR WangDAT 3900 DDS3 12-24 GB DAT Int	1,320
WangDAT 3900 DDS3 12-24 GB DAT Ext	1,440

Remote Access

3COM Office Connect Boundary Router 3C8841	1,247
Office Connect Remote 510 ENET,ISDN	586
Office Connect Remote 520U ENET, ISDN, POTS	733
Office Connect Remote 530U ENET, ISDN, ASYNC	1,100
ARTISOFT InSync Modemshare 1/2/4/8Pt	108/187/348/592
CISCO 2501 1 ENET, dual serial router (software req)	1,906
2514 2 ENET, dual serial router (software req)	2,340
DIGI LANAserver 2E 2 Async	1,290
LANAserver 6E 4 PCMCIA slots; 2 Async	2,152
LANAserver 8E 8 Async	2,588
LANAserver 10E 8 PCMCIA slots; 2 Async	2,896
EMULEX Connect Plus 2 ports/8 Ports	784/2,417
NOVELL NetWare Connect 2	309
NetWare Connect 8/32 pts	1041/3,405
NetWare Connect 2-port w/Modem and Serial I/O	873
NetWare Connect 8-port w/Modem and Serial I/O	3,132
HEWLETT PACKARD AdvanceStack Dial-A-LAN Modules	
2A/Plus Module and SNMP Bundle J2633A	1,476
4A Module and SNMP Bundle J2634A	1,476
SHIVA Netmodem/E 28.8	889
AccessPort/D Enet ISDN router	758
Lanrover/E Plus w/2 Async ports/4 Async	1,784/4,329
Lanrover/E Plus w/2 v.34 modems/4 v.34	2,435/5,715
Lanrover/E Async 8 Async/8 v.34 modems	3,652/7,729
DIGI INTERNATIONAL Digi 2-Pt/4-Pt/8-Pt	200/455/588
Acceleport 8EM w/RISC CPU, DB25 ISA/PCI	709/723
Paradyne 3150 T-1 Frame Relay CSU	1,157

ISDN Connectivity

3COM Impact IQ 3C882	334
ASCEND NetWarp 128 ISA Terminal Adapter	174
NetWarp Pro w/ POTS port	282
Pipeline 25-FX Bridging	480
Pipeline 25-FX IP or IPX	721
Pipeline 50 w/NT1, COMP, IPX,IP	634
Pipeline 75 Multi w/NT1, COMP, IPX, IP, 2 Analog	703
Pipeline 130 w/FT1,T1,ISDN	1,386
Pipeline 130 ISDN & L56/SW & L56	1,342/1,412
Max 200 Plus w/4 BRI Cards	3,043
Max 1800 8BRI-16 users w/NT1	5,216
CISCO 762 ISDN Rtr/Cisco 766 w/2 Analog Pts	544/668
Cisco 772 4-10BT/Cisco 776 4-10BT, 2 Analog	668/794
Small Office/Home Office Sw 4 users, COMP, IP, IPX	134
Remote Office Sw 1500 users, COMP, IP, IPX	251
DIGI DataFire U Client ISDN (PPP)	398
DataFire Server S1 Server-Based ISDN	536
PC-IMAC ISDN	533
PC-IMAC Multiport ISDN/4-1/4-2/4-4	672/1,064/2,092
MOTOROLA BitSurfr PRO ISDN TA w/NT1 w/2POTS	333
SHIVA Lanrover/E Plus 2-BRI Enet	2,539
Lanrover/E Plus 4-BRI Enet	6,217
US ROBOTICS Sportster ISDN adapter	247
Courier-I Modem w/V.34 w/Analog Int/Ext	260/311
Courier-I Modem w/ISDN/V 34 w/o Analog Int/Ext	326/354

Internet Solutions

3COM OfficeConnect Gateway 535 ISDN IPX to IP	1,468
BAY NETWORKS Instant Internet 20 Usrs w/Modem	1,877
Instant Internet 20 Users w/ISDN	2,177
Instant Internet Dual-Enet 20 Users w/Modem	2,064
Instant Internet Dual-Enet 20 Users w/ISDN	2,380
Instant Internet 10-User Add-On Pack	377
FARALLON Netopia Internet Router IP/Appletalk	1,061
Netopia Internet Rtr TCP/IP 12-Users/.Unlimited	752/874
HP AdvanceStack Internet Router module J3138A	2,898
NETSCAPE Suite Spot for NT	1 874

Network Printing Solutions

3COM Office Connect Print Server (2P)	340
CASTELLE LANpress 3P/100 (10/100BTX)	415
EXTENDED SYSTEMS 100BaseTX MIO	368
HEWLETT PACKARD JetDirect 10BT MIO	339
JetDirect Combo MIO BNC/10BT	400
JetDirect Card for 10/100Base-TX J2556B	407
JetDirect Ethernet EX Plus/ EX Plus 3	299/337
JetDirect Token Ring EX/EX Plus3	567/682
INTEL Netport EL Ethernet/Token Ring	422/588
NetportExpress XL for Ethernet/TR	415/565
NetportExpress Pro 10BT Int(MiO)/3 Pack	175/747
NetportExpress Pro 100 10/100BTX 2P/1S/3Pk	396/1,079

Network Fax Solutions

3COM Office Connect Fax Server (1L)	1,277
CASTELLE FaxPress 1500 1-Line/2-Line	2,133/2,453
Faxpress 3000 2-line/FaxPress 3000 4-line	2,948/3,574
Faxpress 3500 2-line/FaxPress 3500 4-line	3,196/3,793
FAX-IT-BACK Software	799
CHEYENNE FaxServe NLM 5/10/25	393/717/1,177
FaxServe NLM 50/100	1,816/2.533
FaxServe NLM 250/500/1000	3,801/4,982/6.229
ZOOM Multiline 8 slot w/4 fax modems, hot swap	937
SYMANTEC Net Satisfaxtion 25/1000 users	742/990
Winfax Pro for Networks 5/10/25/50	384/ 640/1.478/2.738
Starter Kit (1 Server 2 nodes)	258

Network CD-ROM

3COM OfficeConnect CDROM server	650
MICRO DESIGN SCSI Express for NetWare, MDI	599
SCSI Express CDROM, Non-MDI	808
CD-Rom LaserBank 600CD Ext. Single/Dual	599/1,117
MICROTEST Discport Ethernet/Token Ring	488/818
Discport w/ Discview Pro ENET/TR	733/1,066
Discport XL ENET w/Discview Pro	659
Discport w/NEC 6X 4CDROM in 7-Unit Tower	1,972
Discport w/NEC 6X 7CDROM in 7-Unit Tower	2.708

Uninterruptible Power Supplies

APC Back-UPS 400/450	163/200
Back-UPS 600/900/1250	273/392/512
Powerchute Plus for Novell/Unix/Windows NT	99/149/99
Smart-UPS 700NET/1400NET	389/671
Smart-UPS 2200NET/3000NET	1,067/1.788
Matrix 3000/5000/Smartcell	3,720/4,616/537
SNMP Agent for Novell/SNMP Mgr for Netware	125/145

Cable Testers & Supplies

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AT10K Crimper Kit w/5 DIES & case	259
RJ45 10 BaseT Connectors (100 pak)	40
10Base-T Cable (1000' min) LV3/LV 5	100/200
FLUKE LAN CableMeter 620/CableMeter 650	728/1,760
MICROTEST Cable Tester	300
Penta Scanner w/Super Injector	3,019

E-Mail

cc:MAIL Desktop-Windows/DOS	125
cc:Mail License 10 users/50 Users	596/2,802
Mobile for Windows/Win95&WINNT	146/146
Router/Fax Server/Web (Single)	95/1,433/189
Link to UUCP/Link to SMTP/Link to MHS	372/2,473/499
MICROSOFT Mail Server + 10 Users	480
Mail 5/20/100 Users	273/930/3,633
MHS Gateway/PROFS	708/3,405
SMTP/X400/Fax Gateway	3,241/3,194/1,419
Exchange Server Single w/ 5/10/25	1,014/1,368/2,160
Exchange Server Enterprise w/25/50 Clients	4,099/5,429
Exchange Add'l Clients 5/20	366/1,160
Exchange Internet Mail Connector	498

Network Management

3COM Transcend Workgroup Mgr for Windows	461
Transcend Enterprise Mgr for Windows	2,453
HP Openview Pro. Suite	1,122
INTEL LanDesk Mgmt Suite 5/10/100 users	522/696/4,240
LanDesk Server Manager Pro	1,232
LanDesk SNMP Gateway/Response	552/692
NOVELL Lanalyzer for Windows	1,021
NetWare LANalyzer Agent Multi-Segment	1 178

Network Utilities

CHEYENNE AuditWare for NDS 100/Enterprise	460/651
Directory Mgmt. Combo/Enterprise	850/1,951
InocuLAN Wrkgrp/1Svr-Unlimited	301/648
InocuLAN 5 Svr-Unlimited Users	2,363
InocuLAN Option v4.0 for ARCserve 6	313
INTEL LanDesk Virus Protect NW(Single)	1,024
LanDesk Virus Protect 4-pk/20-pk	3,460/14,438
ONTRACK Data Recovery NetWare	411
SEAGATE Prepare! Disaster Recovery SW	525
SYMANTEC Anti-Virus for NetWare 10/25	605/1,378
Norton Admin 5/10 Users	247/438
Norton Admin. 25/50/100 Users.	1,068/2,028/3,680

Server Mirroring

VINCA Campus Standby Server Software for NW	2,228
Standby Server NetWare/Windows NT	2,535/2,535
Entry StandBy Server/SnapShot Svr for NW	966/736
Standby Server Many-To-One	5,071

Windows NT Solutions

3COM Transcend Workgroup Mgr for NT	463
Transcend Enterprise Manager	2,353
CHEYENNE Arcserve for Windows NT v6.0, Single Svr	490
Arcserve for Windows NT v6.0, Enterprise Edition	860
Arcserve for NT NetWare Agent	438
Arcserve Changer Option for Windows NT	365
Arcserve Disaster Recovery Option for NT	271
InocuLAN for Windows NT Single/10/25 Usrs	69/270/414
Open File Agent for Windows NT	500
EXECUTIVE SOFTWARE Diskeeper/5-Pack	266/1,089
INTEL Landesk Workgroup Mgr 25	1,615
LANDesk Virus Protect NT	1,028

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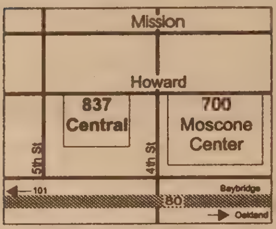

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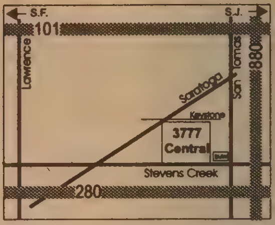

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Keytronic 104 PS/2 Keyboard
Hitachi CM500U 15" Monitor
Microsoft PS/2 Mouse
Diamond Video 64 2MB VRAM VGA
Creative Labs Sound Blaster 16
SP-2 Supreme Sound Speakers
CNet 930 PCI PnP Ethernet Card

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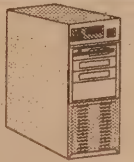
SPECIALS

HM2: Headset w. volume control	14.95
KC3: Headphone + Microphone	8.95
MC1: Pocket Size Microphone	9.50
MC2: Condensed Microphone	6.95
SD202: Full Range Speakers, 120W	24.95
SD322: Sub-Woofer	44.95
SD688: Deluxe 3D Surround, 360W	54.95
SD880: Amplified Stereo Speakers, 200W	*(29.95)
SD980: 3-Way Speakers, 180W	*(39.95)
SP2: Supreme Sound Speakers w. KC1	19.99

Reseller CALL for wholesale prices!

2. CASE



#1: Baby AT w. 230W Power	49
#2: Baby Tower w. 230W Power	45
#3: IWG500 Mid Tower w. 230W	65
#4: Mid Tower w. 250W Power	55
#5: CF-8502A Mid Tower w. 250W, Open Side	69
#6: GT212 Mid Tower, 250W, Open Side, 2 fans, White	105
#7: GT210 Mid Tower, 250W, Open Side, 2 fans, Black	109
#8: Full Tower w. 250W, 2 fans	85
#9: CF-8501S Full Tower w. 250W, Open Side	89
#10: KS-A5561 Full Tower, 250W, Slide Open, 2 fans	115
#11: Full Tower, 300W, with Wheels	149
#12: GT312 Full Tower, 300W, Open Side, 2 fans, 8 Bay Slots, PS/2 power, White	155
#13: GT300 Full Tower, 300W, Open Side, 2 fans, Black	165
#A1: ATX CF-8502A Mid Tower, 235W, Open Side	85
#A2: ATX mini-mid Tower w. 230W	89
#A4: ATX-T5 Mid Tower w. 235W, Slide Open	89
#A5: ATX CF-8501S Full Tower, 235W, Open Side	109
#A6: ATX GT-232XC Mid Tower w. 235W	125
#A7: ATX GT-312 Full Tower w. 235W	159
#A8: ATX PC-268A Desktop w. 235W	79
#A9 ATX PC-968A Mid Tower w. 235W	79
#A10 ATX PC-768A Full Tower w. 250W	105

HDD EXTERNAL CASING:

3.5" HD External Casing	52
5.25" or CD Rom External Casing	55
1 half ht, 50W, SCSI-2	82
2 half ht or 1 full ht for PC, 80W, w/o cable	82
4 half ht or 2 full ht, 200W, w. cable	109
4 half ht or 2 full ht, SCSI-3	139
7 half ht or 3 Full, SCSI-3	209
8 half ht or 4 full ht, 250W, w. cable	225
MAP-431-1 1 half ht & fan, 50W, SCSI-3	92
PD-250 Para Disk, 2.5", IDE Kit, carrying bag	57
PD-350 Para Disk, 3.5", IDE Kit	67
PD-525EZ Para Drive, CD-Rom Kit, carrying bag	65

ANTEC

KS-011+RPP3002: 19 Bay Server (9 front, 10 int. bay) 300W, Hot-Swap + Redundant P/S, 2 Cooling Fan	599
KS-011+RPT600: 19 Bay File Server (9 front, 10 int. bay) 300W Redundant Vertical AT P/S, 2 Cooling Fan	479

OTHERS

19" Indsutrial Rackmount Chassis	295

3. CONTROLLER

adaptec

1522A Fast SCSI Board, 3Mb/s / w. Kit	79/145
1542CP SCSI Board, 10Mb/s / w. Kit	169/239
2940 SCSI PCI w. Kit oem	209
2940U SCSI PCI w. Kit oem / reg	225/249
2940UW Ultra Wide-SCSI PCI w. Kit oem	265
AHA3940U PCI Multi-Channel SCSI	399
AHA3940UW Ultra-Wide w. Kit	479
APA1460 Slim PCMCIA SCSI	165
ASW-EZ SCSI 3.1 for Dos & Windows	59
ASW-EZ SCSI 4.0 for Win'95	69

ADVANSYS

ABP5140 SCSI-2 ISA 8Mb/s	115
ABP930 Ultra SCSI PCI 20Mb/s	135

ASUS

PCI-AS2940UW SCSI & 16-bit audio adapter	215
SC200 SCSI-2 PCI (w. NCR chips)	79

COREL

Corel SCSI Software v2.5	85

FUJITSU

PCMCIA Type II SCSI-2, 10Mb/s	199

INITIO

INI-9100U PCI SCSI Kit, 20Mb/s	149
INI-9100UW PCI Ultra-Wide SCSI Kit	199

KOUWELL

KW557A IDE/ 1.44/ 2S(FiFo)/ ECP/ 1G	29

LDP (Lomas Data)

Fast PCI SCSI-2 10Mb/s	**(115)*
Fast PCI 20, Ultra Wide SCSI, 40Mb/s	215

NEW MEDIA

Basic SCSI DB25 PCMCIA	99
Bustoaster SCSI-2 PCMCIA	165

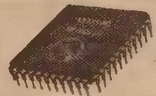
SIIG (5 yr. warranty)

CN2419 EIDE 4HD/ 2FD 16 bit ISA	59
CN2420 EIDE 4HD 16 bit ISA	39
CN2424 EIDE 4HD/ 2FD/ 2S 1P 1G/ 16550 & IEEE1284	79

OTHERS

DIAMOND Fire Port 40 Ultra-SCSI PCI	169
PROMISE EIDE 2300 Plus IDE/ 4HD/ 2S 1P/ 16550	59
WD Fast SCSI-2 PCI, 10Mb/s	79

4. CPU



AMD

AMD-X5-133	45
AMD-K5-75	45
AMD-K5-133 / AMD-K5-166	89/119
AMD-K6-166 / AMD-K6-200	299/419

CYRIX (w. fan)

6x86-P150+ (3.5V) / 6x86L-P150+ (2.8V)	99/106
6x86-P166+ (3.5V)	109
6x86L-P166+ (2.8V)	118
6x86-P200+ (3.5V)	149
6x86L-P200+ (2.8V)	158

intel.

486 DX2-66 / 486 DX4-100	45/49
MMX-166Mhz Pentium®	289
MMX-200Mhz Pentium®	529
MMX-166Mhz Pentium® (3 yr. warranty)	309
MMX-200Mhz Pentium® (3 yr. warranty)	559
P54C-100Mhz Pentium®	109
P54C-120Mhz Pentium®	115
P54C-133Mhz Pentium®	145
P54C-150Mhz Pentium®	165
P54C-166Mhz Pentium®	215
P54C-200Mhz Pentium®	275
133MHz Pentium® w. fan (3 yr. warranty)	**(155)*
150MHz Pentium® w. fan (3 yr. warranty)	**(179)*
166MHz Pentium® w. fan (3 yr. warranty)	225
200MHz Pentium® w. fan (3 yr. warranty)	299
Pentium® II 233Mhz (3 yr warranty)	799
Pentium® II 266Mhz	869
Pentium® II 266Mhz (3 yr warranty)	899
Pentium® Pro 180Mhz w. fan	469
Pentium® Pro 180Mhz w. fan (3 yr. warranty)	489
Pentium® Pro 200Mhz w. fan & 256k	559
Pentium® Pro 200Mhz w. fan, 256k, 3 yr warranty	**(589)*
Pentium® Pro 200Mhz w. fan & 512k	1119

OverDrive®:

Pentium® 63Mhz (fr 486-25 or DX2-50)	149
Pentium® 83Mhz (fr 486-33 or DX2-66)	199
Pentium® 133Mhz (fr 586-60 / 66)	275
Pentium® 166Mhz (fr 586-100)	485

OTHERS

Cooling Fan for 486 CPU	4.95
Cooling Fan for Pentium® processor	6.95

5. DIGITIZER

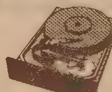
SUMMASKETCH

III 12 x 12, 4 or 16 button cursor / stylus	**(249)*
III 12 x 18, 4 button cursor	**(395)*
- 2 button stylus for III	39

WACOM

Art Pad II 4x5, w. Erasing Ultra Pen for PC	135
- w. Fractal Dabbler	155
Art Pad II 4x5, for MAC	139
Art Z II 6x8, w. Erasing Ultra Pen for PC	**(299)*
- for MAC	309
Art Z II 6x8, w. Fractal Expression	365
Art Z II 12x12, w. Erasing Ultra Pen for PC	415
- for MAC	429
Art Z II 12x12, w. Fractal Expression	479
Art Z II 12x18, w. Erasing Ultra Pen for PC	685
UD-2 Mac Kit	45
UD-520 4-button Cursor	109
UP-201 Pressure Stylus	49.95
UP-701E Erasing Ultra Pen	69 95

6. DRIVE



FLOPPY DRIVE :

TEAC

1.2MB 5.25"	43
1.44MB 3.5" / w. frame	27/31

HARD DRIVE :

FUJITSU

M1636TAU 1.2GB 10ms 128k, 5400rpm, IDE	169
M1623TAU 1.7GB 10ms 128k, 5400rpm, IDE	179
M1624TAU 2.16GB 10ms 128k, 5400rpm, IDE	**(259)*
M1638TAU 2.56GB 10ms 128k, 5400rpm, IDE	219
M2954QAU 4GB 8ms Wide-SCSI	749
M2954SYU 4GB 8ms 512k, 7200rpm, SCSI-2	699
M2949SYU 9GB 10ms 512k SCSI	**(1195)*

IBM

DCAS-32160 2GB 8.5ms Ultra-Wide SCSI, 5400rpm	399
DCAS-34330 4.3GB 8.5ms Ultra-Wide SCSI, 5400rpm	549

KINGSTON

PCMCIA 260MB IDE, type III	375
PCMCIA 340MB IDE, type III	445

Maxtor®

MXT-81750A 1.7GB 12ms 64k IDE	189
MXT-82187A 2.1GB 12ms 128k IDE	199
MXT-82560A 2.5GB 10ms 256k IDE	219
MXT-85120A 5.1GB 10ms 256k IDE	395

Quantum®

SALE (limit 1 per customer, while supplies last)

FBTM-32110S 2GB SCSI-2	**255**

FBTM-1280A 1.2GB 12ms 128k IDE	179
ST-32160A DMA 2GB 10ms 128k IDE	215
FBTM-3200AT 3.2GB 11ms 128k IDE	249
FBTM-33840AT 3.8GB 11ms 128k IDE	295
ST-34320A DMA 4GB 10ms 128k IDE	379
FBTM-3200S 3.2GB 10ms 64k SCSI	319
Atlas-2 45500S 4.3GB 8ms 512k Ultra SCSI	795
Atlas-2 4550W 4.3GB 8ms 512k Ultra-Wide-SCSI	769

Seagate

ST-31276A 1.2GB 12ms 64k IDE 1" ht.	169
ST-32132A 2.1GB 12.5ms 128k IDE	189
ST-51080N 1GB 12.5ms 128k SCSI	259
ST-32171N 2GB Ultra-SCSI	515
ST-32171W 2GB Ultra-Wide SCSI	545
ST-34371N 4GB Ultra SCSI	779

**(price) .... SPECIALS , while supplies last*

http://www.centralcomputer.com for update price & catalog

ST-34371W 4GB Ultra-Wide SCSI	799
ST-34501W 4.5GB ŬW-SCSI, 10,000rpm	925
ST-19171N 9GB Ultra SCSI	1310
ST-19171W 9GB Ultra-Wide SCSI	1345

TOSHIBA (notebook drive)

PCMCIA 262MB IDE	425
MK1401MAV 1.4GB IDE 2.5"	245
MK2103MAV 2GB 13ms 128k IDE 2.5"	399

WESTERN DIGITAL

SALE (limit 1 per customer, while supplies last)

WD-33100 3GB 12ms 128k IDE	**249**
WD-11200 1.2GB 11ms 128k IDE	**(179)*
WD-21600 1.6GB 10ms 128k IDE	189
WD-22000 2.1GB 12ms 128k IDE	209
WD-32500 2.5GB 12ms 128k IDE	225
WDC-AC34000 4GB IDE	329
WDC-E2170 2.17GB Ultra SCSI	529
WDC-E2170 2.17GB Ultra-Wide SCSI	545
WDC-E4360 4.3GB Ultra SCSI	739
WDC-E4360 4.3GB Ultra-Wide SCSI	769

OTHERS

Descartes PCMCIA Card Reader /Writer for PC	109
Mounting Frame for 3.5" Hard / Floppy Drive	4/4
Removable Case for 3.5" HD IDE	23
Removable Case for HDD SCSI	25

REMOVABLE DRIVE :

IOMEGA

SALE (limit 1 per customer, while supplies last)

Jaz Drive 1GB SCSI Int / Ext	**285/379**
Jaz Disk 1GB / 5 Pack	**(99/475)*
Zip Drive 100MB SCSI Int / Ext	145/145
Zip Drive 100MB Parallel	145
- Zip Disk 100MB : Single / 3-Pack	17.95/48
- Zip Disk 100MB : 6-Pack / 10-Pack	95/155
Zip Zoom SCSI Accelerator Card	54

7. I/O CARD

FUJITSU

PCMCIA Serial Card	135

KOUWELL

KW508-E Single Parallel Port	12
KW524J-1 2S /2P w. 16550 chips	29
KW524L 2S(FiFo) / 1P / 1G w. 16550 chips	32

QUICKPATH

FlexPort 42: 4 Serial / 2 Parallel (Bi - Dir), 16550	99
FlexPort 22EX: 2 Serial / 2 Parallel / 16650	99
PortFolio 550E: 13 Port Multi-I/O, 4 Serial/ 4 FDD/ 2 Parallel/ 2 IDE/ 1G	125

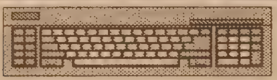
SIIG

Cyberpro 2S Highspeed w. 16650 chips	55
Cyberpro 4S Highspeed w. 16650 chips	89
IO1809 2S/1P w. 16550 chips	39
IIEEE 1284 EPP/ ECP/ Parallel Port	32

STB 4-COM

4 Serial, 16 bit, 16550, support Com 1-8, IRQ (2,3,4,5,10,11,12,15)	99

8. KEYBOARD



FOCUS

FK2001 104 for Win'95	32
FK8000 101 w. Calculator	39
FK7200 101 Trackball	32
FX9200W 104 Pro	48

KEYTRONIC

Keytronic 104. White / Black	*(29)/45
Wireless IR Classic 104	78
Wireless IR Trackball	109
Wireless IR Touchpad	125

MICROSOFT

Natural Keyboard oem	65

QTRONIX

Scorpius 104+ for Win'95: White / Black	23/24
Scorpius 105 / w. Trackball	32/49

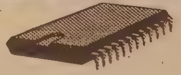
SIIG

Minitouch 81-key Click	45
Supertouch 101 Click	53
W104 (for Win'95)	29
Wintouch 104	39

OTHERS

Antec 104: White / Black	21.50/39
BTC 5100 Key Mini (80-key)	35
EZ Key Natural Keyboard	36
Maxi 101 / Maxi 124	33/49
Mitsumi 104 Model-ZW	16.50
Northgate Omnikey Evolution/Glide Point	**(95)*

9. MEMORY



DIMM

4 x 72 - 60ns, 168-pin (32MB)	259
8 x 72 - 60ns, 168-pin (64MB)	499

SIMM

1 x 9 - 60ns / 70ns	(1MB)	10/10
4 x 9 - 60ns	(4MB)	29
1 x 36 - 60ns	(4MB, 72 pin)	39
2 x 36 - 60ns	(8MB, 72 pin)	75
4 x 36 - 60ns	(16MB, 72 pin)	105
8 x 36 - 60ns	(32MB, 72 pin)	209
16 x 36 - 60ns		509
EDO 1 x 32 - 60ns	(4MB)	23
EDO 2 x 32 - 60ns	(8MB)	42
EDO 4 x 32 - 60ns	(16MB)	75
EDO 8 x 32 - 60ns	(32MB)	149
Non Parity : 1 x 32 - 60ns		23
Non Parity : 2 x 32 - 60ns		42
Non Parity : 4 x 32 - 60ns		75
Non Parity : 8 x 32 - 60ns		149
Non Parity : 16 x 32 - 60ns		429

NOTEBOOK MEMORY (3rd party)

for AcerNote 374, Nuovo 971/ 972 - 8MB / 16MB / 32MB	95/145/499
for AST Ascentia 950N - 8MB / 16MB	115/165
for AST Ascentia J30 / J50 - 8MB / 16MB / 32MB	85/139/258
for AST Ascentia P30/ P50 - 8MB / 16MB	115/175
for Compaq Armada 4120 / 4130 - 8MB / 16MB / 32MB	95/155/269
for Compaq Contura 410 / 420 / 430 - 4MB / 8MB / 16MB	75/99/155
for DEC HiNote 433 / 450 / 475 - 4MB / 8MB / 16MB	59/89/145
for HP Omnibook 5000 / 5500 - 8MB / 16MB / 32MB	109/165/285
for IBM Thinkpad 365X / 560 / 760EX/ ED/ EL - 8MB / 16MB / 32MB	99/155/525
for NEC Versa 6030X / H - 8MB / 16MB / 32MB	105/165/295
for Panasonic CF-62EX / 25EX - 8MB / 16MB / 32MB	95/145/499
for TI TravelMate 6020 / 6030 - 8MB / 16MB	99/169
for Toshiba T1900 / T4500 / T200CS - 4MB / 8MB / 16MB	89/109/165
for Toshiba Portege 610CT - 8MB / 16MB / 32MB	99/149/259
for Toshiba Portege 650/ 660CDT - 8MB/ 16MB / 32MB	95/145/275
for Toshiba Tecra 700 - 32MB	**(235)*
for Toshiba Tecra 710/ 720/ 730CDT - 8MB / 16MB / 32MB	99/149/259
for Toshiba Satellite 430CDS/CDT / 100 / 200CDS/CDT - 8MB / 16MB / 32MB	99/149/259

PCMCIA Flash RAM Card

2MB / 4MB / 8MB / 16MB	105/139/215/335

OTHERS

Memory for Laser Printer upgrades	Call

10. MODEM & FAX

APOLLO

PCMCIA 33.6 w. AT&T chipset	115

BOCA

SALE

FDV141 14.4 Voice Fax Modem Int	**99)**
M144AE 14.4 Online Express Ext	***(69**
SE1440 14.4 VSP Sound Express Fax	***(89)**
SE14SRS 14.4 Sound Expression Int	***(99)**
SE34SRS 28.8 Sound Expression Int	***(149)**

DIAMOND

Supra Express 33.6 Fax PNP & Void Int oem	69
Supra Express 33.6 Fax PNP Int / Ext	75/99
Supra Express 56k Fax PNP Int / Ext	139/155
SupraNet Commander ISDN	235

FUJITSU

PCMCIA 28.8 v.34 Type II	279
PCMCIA ISDN	325

MEGAHERTZ

XJ1336 PCMCIA 33.6 Flash upgradable	199
XJ1560 PCMCIA 56k	224
XJ4288M PCMCIA Fax, cellular w. Motorola cable	249
XJ4336 Cellular Ready 33.6	**(219)*

MICROCOM

Deskporte 28.8S V.34 Fax Ext	**(115)*
Deskporte 28.8P V.34 Ext Parallel	**(165)*
Officeporte 33.6 Voice ASVD Ext	155

HAYES (Prac. Peripherals)

SALE

Accura 33.6 Fax Int / Ext	**149/159**
ESP Single Port	***(85)**
Optima 33.6 v.34 Fax Int	**239**
Optima 288 v.34 Fax Voice Ext	***(199)**
Optima 288 v.34 PCMCIA w. EZ jack	***(185)**
PC288HC 28.8 v.34 Fax, 230K DTE Int	***(219)**
PC288MT 28.8 v.34 Fax Ext	***(229)**
PM288HC 28.8 v.34 Int	***(85)**
PM336HC 33.6 Int	**99**
PM336MT 33.6 Ext	**119**

MOTOROLA

SALE

BitSerfer ISA ISDN	***(245)**
BitSerfer TA210 ISDN Ext	***(249)**
BitSerfer Pro ISA ISDN Int	***(298)**
BitSerfer Pro ISDN Easy	***(285)**
BitSerfer Pro ISDN Multilink PPP Ext	***(299)**
Modem Serfer 33.6 Int / Ext	**129/145**
Modem Serfer 56k Int / Ext	**142/159**
Montana PCMCIA 33.6	***(179)**
Montana 33.6 w. cellular cable	***(199)**
Online Serfer 28.8 Fax Int / Ext	***(119/129)**
Premier 33.6 Modem Int / Ext	***(179/199)**
Voice Serfer 33.6 Int / Ext	**149/165**

USRobotics

SALE

Courier I-Modem #1 with Analog Int / Ext	295/355
Courier I-Modem #2 v.34 w. NT1 Int / Ext	*(215)/335
Courier I-Modem #3 v.34 Int / Ext	235/*(265)
Courier V. Everything 33.6 Int / Ext	**(215/229)*
Courier V. Everything 56k Int / Ext	239/275
Sportster ISDN 128k Int	245
Sportster 28.8 Win Modem Int	99
Sportster v.34 33.6 Fax for MAC	215
Sportster v.34 33.6 Fax/ Voice / Speaker Phone Int oem	119
Sportster v.34 33.6 Fax/ Voice / Speaker Phone Int reg	149
Sportster v.34 33.6 Fax/ Voice Mail/ Speaker Phone Ext.	179
Sportster 56K Int / Ext	179/199
Sportster 56k w. Voice Int / Ext	199/219
Total Control Modem: Pool/8	2950
Total Control Modem: Pool/16	5560

WISECOM

SALE

WS-2814IS6W 28.8 Data/ Fax/ Voice Int	**65**

XIRCOM

CM-28 28.8 Fax PCMCIA	**(179)*
CM-33 33.6 Fax PCMCIA	229

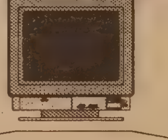
ZOOM

#620 Comstar 28.8 Voice v.34 Tel Int	**(125)*
#2805 33.6 Fax Modem Int	**(95)*
#2836 33.6 Fax Modem Ext	**(105)*

OTHERS

3D Fax Pal: 0.5MB / 2MB	135/179
CommShare 550 Phone & Fax Auto-switch	**(69)*
CommShare 750 4 Port Switching	**(89)*

11. MONITOR



20 big Monitors on display

ACER

78iE 17" 1600 x 1200 .26 NI	545

ARTMEDIA (Sony oem)

TX1664 15" 1280 x 1024 .25 NI	369
TN1885 17" 1600 x 1280 .25 NI	779
TX1864 17" 1280 x 1024 .25 NI	615
GT960T 20" 1600 x 1280 .25 NI	1499

DIGIVIEW

SALE

HR-1709D 17" 1600 x 1200 .25 NI	**595**
HR-1434 14" 1024 x 768 .28 NI	189
HR-1508+ 15" 1280 x 1024 .28 NI	259
HR-1708 17" 1280 x 1024 .28 NI	475

HITACHI SuperScan

CM500U 15" Flat 1280 x 1024 .28 NI, 65hz	**(295)*
CM611U 17" 1600 x 1280 .22 NI, 69hz	679
CM620U 17" Flat 1280 x 1024 .28 NI	545
CM751 19" 1600 x 1200 .26 NI, 75hz	1069
CM2011M 20" 1600 x 1200 .28 NI	1165
CM800U 21" 1600 x 1200 .22 NI	1399
CM802U 21" 1600 x 1200 .22 NI	1729
CM803U 21" 1800 x 1440 .22 NI, 77hz	1849

IBM (touch screen)

G41T 14" Touch Monitor .28	895
G50T 15" Touch Monitor .28	985
G70 17" 1280 x 1024 .28, 60hz, FST	785
G70T 17" Touch Monitor .28	1465
P70 17" 1600 x 1200 .26, 60hz	995
G200 20" 1600 x 1200 .28, 60hz	1385
P200 20" 1600 x 1280 .31, 60hz	1785
P201 20" 1600 x 1200 .26mm, 85hz	2445

IIYAMA

SALE

MF-8515G 15" 1280 x 1024 .28 NI	**329**
MF-8617E 17" 1600 x 1200 .26, 69hz, NI	**575**
MT-9017E 17" 1600 x 1200 .25, 72hz, NI	**675**
MF-8221E 21" 1600 x 1280 .22, 76hz, NI	**1285**
MF-8721 21" 1800 x 1440 .22 NI, 74hz	**1435**
MT-9021E 21" 1600 x 1280 .30, 76hz, NI	**1359**

IMPRESSION

3 Plus 14" 1024 x 768 .28 NI	189
5 Plus 15" 1280 x 1024 .28 NI	259
7 Plus 17" 1280 x 1024 .28 NI	475

KFC

CA1515DS 15" Flat 1280 x 1024 .28	**(299)*

KOMODO (2 yr warranty)

H40 14" 1024 x 768 .28 NI, Digital	**(185)*
H51 15" 1280 x 1024 .28 NI, Digital	249
H73 17" 1280 x 1024 .28 NI, Digital	459

MAG

DX15T 15" 1280 x 1024 .26 NI	**(359)*
DJ700 17" 1280 x 1024 .26 NI	579
DJ702 17" 1280 x 1024 .26 NI	**(569)*
DX700T 17" 1280 x 1024 .25	665

MAXTECH (GVC, 3 yr warranty)

XT-4888 14" 1024 x 768 .28	189
XT-5988 15" 1280 x 1024 .28 NI	245
XT-7800 17" 1280 x 1024 .28 NI	459

NANAO

FX-C5 17" 1280 x 1024 .26 NI	759
FX-C6 17" 1280 x 1024 .26 NI	839
T2.17TS 17" 1280 x 1024 .25, Diamondtron	899
TX-C7S 17" 1600 x 1200 .25, Trinitron	999
T2.20 20" 1600 x 1280 .30 NI, Trinitron	1675
FXE8 21" 1600 x 1280 .26 NI	2245

NEC

M500 15" 1280 x 1024 .25 NI	**(369)*
XV15 Plus 15" 1024 x 768 .28	369
M700 1280 x 1024 .25 NI	**(759)*
P750 17" 1600 x 1200 .25	879
XV17 Plus 17" 1600 x 1200 .28 NI	**(689)*
E1100 21" 1600 x 1200 .28 NI	1415
P1150 21" 1600 x 1200 .25, 75Hz	1799
XM3750 37" 1024 x 768 Multimedia Monitor	5475
XP3778 37" 1280 x 1024 Data Monitor	7795

NOKIA

447L 17" 1024 x 768 .28 NI	**(615)*
447XAV 17" 1600 x 1280 .25 NI	985
447Xi 17" 1600 x 1280 .25 NI	**(845)*
445XAV 21" 1600 x 1280 .26 NI	1845
445Xi 21" 1600 x 1200 .26 NI	1739

OPTIQUEST

V655 15" 1280 x 1024 .28 NI, Digital	329
V775 17" 1600 x 1200 .26 NI	625
2082DC 20" 1600 x 1200 .28	1199

PANASONIC

P17 Pro 17" 1600 x 1280 .25 NI	**(715)*
PM17 17" 1280 x 1024, Multimedia	**(619)*
S17 17" 1024 x 768 .27	579
E21 21" 1600 x 1280 .25 NI, 67hz	1385
P21 Pro 21" 1800 x 1440 .25 NI, 71hz	**(1675)*
S21 21" 1600 x 1280 .25 NI, 72hz	1495

PRINCETON

EO70 17" 1280 x 1024 .28 NI	525
EO75 17" 1600 x 1280 .26 NI	619
Ultra 17 Plus 17" 1600 x 1280 .8 NI	579

PROTON

GM1764 17" Flat 1280 x 1024 .28 NI	**(495)*

SAMSUNG

17GLSi 17" 1600 x 1280 .26 NI, TCO92	725
20GLSi 20" 1600 x 1200 .28 NI, at 66Hz	1235

SCEPTRE (3 yr warranty)

P401 14" 1024 x 768 .28 NI, Digital	199
P531 15" 1280 x 1024 .28 NI, Digital	275

**(price) .... SPECIALS , while supplies last*

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MONITOR **CD** **NETWORK** **NOTEBOOK**

P73A 17" 1280 x 1024 .26 NI, Digital	499
P73B 17" 1280 x 1024 .26 NI, Digital, Black	525

LCD PANEL: (1 yr warranty)

CD-1011S 11.3" DSTN, 640 x 480	899
CD-1111S 11.3" DSTN, 800 x 600, 64k color	999
CD-1112T 12.1" TFT, 800 x 600, 256k color	1895

SHAMROCK

SRC-1407 14" 1024 x 768 .26 NI, Digital	189
SRC-1502L 15" 1280 x 1024 .28 NI, Digital	245
SRC-703LD 17" 1280 x 1024 .28 NI, Digital	459
SRC-705 17" 1600 x 1280 .26 NI, Digital	485

SONY

CPD-100SF 15" 1280 x 1024 .25, 60hz	409
CPD-100SX 15" 1280 x 1024 .25, 60hz	369
17SEII 17" 1600 x 12000 .25 NI, plug & play	**(899)*
CPD-200SF 17" 1280 x 1024 .25 NI, 75hz	769
CPD-200SX 17" 1280 x 1024 .25 NI, 60hz, PNP	675
20SEII 20" 1600 x 1200 .25 NI	1799
CPD-300SFT 20" 1280 x 1024 .30, 80hz	**(1499)*

TVS

9" 1024 x 768 VGA Mono	119

ViewSonic

E641 14" 1024 x 768 .28 NI	219
E655 15" 1024 x 768 .28 NI	295
15GA 15" 1280 x 1024 .28 NI, built-in speakers	**(375)*
15GS 15" 1024 x 768 .28 NI	339
17EA 17" 1280 x 1024 .28 NI, plug & play	565
17GA 17" 1280 x 1024 .27 NI, plug & play	**(625)*
17GS 17" 1280 x 1024 .27 NI	579
17PS 17" 1600 x 1280 .25 NI, Pn'P, TCO	**(675)*
GT770 17" 1280 x 1024 .25	645
PT770 17" 1600 x 1280 .25	**(699)*
PT775 17" 1600 x 1280 .25, Sonictron	825
G800 20" 1600 x 1280 .28 NI	**(1035)*
GT800 20" 1600 x 1280 .30, Sonictron	1129
G810 21" 1600 x 1280 .30	**(1349)*
P810 21" 1600 x 1280 .25	**(1349)*
P815 21" 1800 x 1440 .25 NI	**(1499)*
PT813 21" 1600 x 1280	**(1449)*
29GA 29" 1280 x 1024 .75 stripe pitch	**(1999)*

WYSE

WY-15E 15" 1280 x 1024 .28 NI	399
WY-17E 17" 1280 x 1024 .28 NI	645
WY-17PS 17" 1280 x 1024 .25 NI	825
WY-55 Terminal 14" Amber/ Green/ White	275 ea.
WY-60 Terminal 14" Amber/ Green/ White	359 ea.
WY-65 Terminal 14" Amber/ Green/ White	345 ea.
WY-150 Terminal 14" Amber/ Green/ White	325 ea.

ACCESSORIES :

VGA Monitor Splitter : 4 Port / 8 Port	155/195
VGA, Keyboard Switch : 4 Way	19.95
VGA, Keyboard & Mouse Switch : 2 Way	24.95
VGA, Keyboard & Mouse Switch : 4 Way	34.95
VGA Switch 1 to 4 Way	13.95

12. MOTHERBOARD

ASUS (w/o cpu)

KN97X Pentium® II 440FX, ATX	305
P55T2P4 586-200, PCI, 512k, Burst SRAM	155
P6NP5 Pro 200Mhz, w. IDE I/O & 440FX chipset	249
P65UP5 Pro 200Mhz, dual Pentium® slots	545
TX97 512k,, TX chipset, w. Dimm socket	175
TX97E 512k, TX chipset, 4 Simm/ 2 Dimm	177
TX97X ATX, 512k, w. sound	209
XP55T2P4 586-200, PCI, ATX, 512k Burst SRAM	159
16MB, 2x72, for Asus board	115
32MB, 4x72, for Asus board	195

DFI (w/o cpu)

G586IPV P-200, 4PCI, 3ISA 256k	139
G586IPC P-200, ECC & Parity supported	175
G586VPS Pro-200Mhz, 256k, 4PCI, 4ISA	179

FIC (w/o cpu)

PA-2005 586-200, 256k, IDE I/O, VIA chipset	115
PT-2006 586-200, 512k, T3, IDE I/O	119
PT-2200 586-200, 512k, T2, IDE I/O	129
VT-501 586-200, 256k, T3, IDE I/O	99

intel. (w/o cpu)

Marl 586-200Mhz, ATX, w. 256k / 512k	129/135
Portland Pentium® II 440FX	335
PR440FX P-200Mhz, dual Pentium® slots	649
Venus Pro-200, IDE I/O, w. 440FX oem	189
Venus Pro w. USB oem	239
Tucson II P-200Mhz, 512k, ATX, & sound	199

J-BOND (w/o cpu)

PCI500C-G2: P-200, 4PCI, EIDE, 430HX, 256k	109
PCI500C-G2: P-200, 4PCI, EIDE, 430HX, 512k	119
- w. AHA-2940UW SCSI on board, 512k	265
PCI500C-H2: P-200, 256k, EIDE, 430VX	99
- w. AHA-2940 SCSI on board, 256k	159
PCI500C-H4: Pentium® II 266Mhz, 512k, VX (support Intel, K5, K6, Cyrix CPU)	105
PCI600A: Pro-200, 4PCI, IRDA, 440FX, ATX	199
- w. AHA-2940UW SCSI on board	345

M-TECH (w/o cpu)

486-DX2-66 256k VESA, 30-pin & 72-pin	99
486-DX4-133 256k PCI, 30-pin & 72-pin	115
586-200Mhz 256k w. Burst SRAM, T2, IDE I/O	145
Mustang-R534 586-200Mhz, 512k, w. IDE I/O	159
R539 512k, TX chipset, 4 Simm / 2 Dimm, EIDE	145
R557 512k, TX chipset, ATX, 4 Simm / 2 Dimm	165
R653 Pentium® II 440FX, ATX, EIDE I/O	245

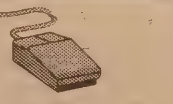
SUPERMICRO USA (w/o cpu)

P5MMA ATX, 512k, TX chipset	169
P5MMS 512k, TX chipset	169
P5STE 586-200 512k, PCI, EIDE I/O, T2, 512k	165
P6DNE Pro 200Mhz, dual Pentium® slots	399
P6DNF Pro 200Mhz, dual Pentium® slots, w. IDE I/O & 440FX chipset	**(429)*
P6DNH Pro 200Mhz, dual Pentium® slots, w. IDE I/O & 440FX chipset	1025
P6DKF Dual Pentium® II 440FX, IDE I/O	439
P6SAS Pro 200Mhz, 2940UW, ATX	335
P6SNA Pro 200Mhz, ATX	259
P6SNE Pro 200Mhz, w. IDE I/O & 440FX	269
P6SNS Pro 200Mhz, w. 2940UW	345
P6SKE Pentium® II 440FX, ATX, EIDE I/O	285
P6SKS Pentium® II 440FX, ATX, SCSI & EIDE	375

TYAN (w/o cpu)

1470 Titan VX w. 256k Pipeline cache	145
1472 Titan VX w. 256k Pipeline cache, ATX	149
1563D Tomcat III P-200, 512k, dual	225
1563S Tomcat III P-200, 512k, 430HX	175
1570 w. 512k, 430TX chipset	165
1572 w. 512k, 430TX chipset, ATX	169
1662D Titan Pro-200, dual, 440FX	359
1662S Titan Pro-200, 3ISA, 5PCI, 440FX	259
1668D Titan Pro-200, dual, ATX	329
1680D dual Pentium® II 512k ATX	345
1680S Pentium® II 512k, ATX	295

13. MOUSE & JOYSTICK



KENSINGTON

Expert Bus 5.0	115
Expert Serial & Trackball 5.0	**(89)*
Mouse in a Box	**(29.95)*
Thinking Mouse (Serial & PS/2)	**(59)*

LOGITECH

Cordless Mouseman 96 / Pro	69/75
Mouseman 96 / Mouseman Bus	52/64
Mouseman Sensa	29
Serial Combo PC & PS/2 oem / reg	32/45
Trackman Live Cordless	125
Trackman Marble for Win'95 oem / reg	59/82

Microsoft

Ballpoint Mouse 2.0 (for notebook)	69
Bus 2.0 400dpi w. Bus Card oem / 5-Pack	65/325
Easyball w. Freddi Fish CD	49.95
Home Mouse Serial	29
IntelliMouse 3.0 for Win'95 ($20 Rebate) reg.	**(69)*
- oem single / oem 5-pk	45/210
PS/2 2.0 (round connector) oem / reg	35/59
Serial 2.0 400dpi oem / reg	29/55

MOUSE SYSTEMS

Mousel Serial w. Pad	19
Omni Mouse (new version)	26
PC Mouse III (3-button optical)	49.50
PC Trackball II	39.95
ProAgio (5-button serial)	39
Serial Bus Card (9IRQs) - 5 com.	29

NEC

2-button King Mouse	19.99

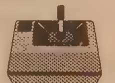
QTRONIX

Libra 90 Pro Trackball	39
Opto-Mechanical Mouse	7.50

OTHERS

AGILER ATB-610 Serial Trackball	19.95
AGILER Bus Mouse	23
ANCER 3-button Black	19
ANTEC Serial Mouse	**(6.95)*
GENIUS Netmouse Serial / PS/2	19.95 ea.
GENIUS Netmouse Combo (serial + PS/2)	24.95

JOYSTICK :



C.H. PRODUCTS

Flight Stick Pro	53
Pro Pedals	79.95
Virtual Pilot Pro (Yoke)	75

LOGITECH

Wingman Extreme oem / reg	39/47
Wingman Standard w. free CD	**(29)*

MICROSOFT

Side Winder 1.0	29
Side Winder 3D Pro	67
Side Winder Game Pad	39

QTRONIX

Orion 90 (joystick)	17
Orion 95 (game pad)	9.50

THRUSTMASTER

ACM Gamecard	29.95
F-16 FLCS	125
F-16 TQS	129
F22 Pro Flight Control (programmable)	139
Flight Control System MK II / w. US Navy Fighters	65/79
Flight Control System Pro	108
Formula T2	119
Rudder Control	109
UPROM	29.95
Weapon Control MK II	109
Wizzard (pinball controller + Royal Flush CD)	39
XL Action / w. EF2000 game	28/33.95

OTHERS

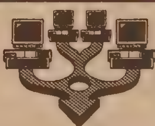
Cobra (by Mouse Systems)	**(9.95)*
Command Pad (by Quickshot)	**(5.99)*
CyberFlight Joystick + Dark Forces	39
Cyclone 3D	43
Dexxa Control Pad w. CD games	18
Game Card (add-on)	**(7.95)*
Game Gun + Crime Patrol	39
Gravis Eliminator Game Card 2 Port	19.99
Graivs Game Port Y Splitter	9.95 ea.
PC Gamepad / Pro	19.95/29
Power Ramp (10-in-1 gamdpad)	49.95
Walt Disney Mouse Pad	4.99 ea

- 101 Dalmations
- Pocahontas
- Toy Story
- Mickey Mouse
- Timon & Pumbaa
- Winnie the Pooh

Warner Brothers Mouse Pad	5.99 ea

- Bugs Bunny
- Homer Simpson
- Tasmanian Devil
- Tweety & Sylvester
- Daffy Duck
- Marvin the Martian
- Wile E Coyote

14. NETWORK



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3Com

3C250A FMS 100BaseTX Fast 12 Port HUB	**(1195)*
3C509B TPO oem	**(59)*
3C509B TP+AUI oem	**(75)*
3C509B-TPC (TP + BNC) oem / reg	*(79)/115
3C509B Combo oem / reg / 5-Pack	94/119/499
3C515-TX Fast 10/100 ISA oem / reg.	135/145
3C562D PC-Card Modem 33.6 + Lan TPO	299
3C562D PC-Card Modem 33.6 + Lan Combo	339
3C575TX 10/100 PC Card	155
3C589D PCMCIA TP / 5-Pack	*(139)/675
3C589D PCMCIA Combo / 5-Pack	*(179)/875
3C597-TX EISA 10/100 TP	239
3C862 Impact ISDN U-Interface (w. NT1) Int	**(345)*
3C882 Impact IQ ISDN with V.32bis Ext	**(335)*
3C900 PCI TPO	115
3C900 PCI Combo oem / reg	*(99)/135
3C905-TX PCI 10/100 TP oem / reg	**(79/99)*
3C16170 Link Builder (12TP)	**(299)*
3C16400 Superstack II 12 Port Switch Hub	**(395)*
3C16405 Port Switch 40 Hub 12 Port	479
3C16406 Port Switch 40 Hub 24 Port	895
3C16590 Dual Speed 12 Port Hub	1195
3C16591 Dual Speed 24 Port Hub	1845
3C16670A Superstack II 12 Port Hub	**(469)*
3C16671A Superstack II 24 Port Hub	845
3C16700 TPO Office Connect HUB (8TP)	**(119)*
3C16701 TPC Office Connect HUB (8TP + BNC)	**(149)*
3C16710 TPM Office Connect Hub + Management	369
3C16720 Office Connect 100 HUB 8 Port	**(665)*
3C16730 Office Connect 10/100 Switch 4TP 1 Fast	**(875)*
3C16900A Switch 1000 24 Port 1 Fast	**(2650)*
3C16901A Switch 1000 12 Port 1 Fast	2095
3C16941A Switch 3000TX 8 of 100TX Port	4195
LANPLEX products	**call**

adaptec

ANA-6901 32 PCI Full Duplex TP / Combo	**(85/99)*
ANA-6910TX PCI Fast-TX, 32 bit bus mastering	175
ATM 25.6Mb/s PCI with 128k / 512k	299/389
ATM 155 Mb/s 512k PCI UTP	725
EM525 Ethernet 16 Combo	**(49)*
EM932 EISA 32 bit Coax / TP	**(98/99)*

ALLIED TELESYN

3012TR Workgroup Hub 12 Port (12TP+AUI+BNC)	175
3016TR Workgroup Hub 16 Port (16TP+AUI+BNC)	199
3024TR Workgroup Hub 24 Port (24TP+AUI+BNC)	259
MC12T: UTP - BNC Conversion Kit	119
MR815T Mini Hub 8 Port	69
MR820TR MicroHub 8 Port (8TP + AUI + BNC)	115
MX26F Fiber Optics Transceiver	145
MX40F Fiber Optics Transceiver	139

ARTISOFT

Extra Mail for Win'95	215
I-Share 2.0 (internet for Lantastic)	179
Lantastic 7.0 for Single - CD / FD	85/89
Lantastic 7.0 10-user - CD / FD	355/359
Lantastic 7.0 1-user Add On	129
Lantastic 7.0 Starter Kit 2-user - CD+FD	249
Lantastic 7.0 Unlimited User - CD	725
Lantastic PowerSuite :	
- 1 / 5 / 10 / 25-user	149/599/1075/2295
- conversion for 1 / 5 / 10-user	89/345/595
NR-Pro 2000A Combo / 10-pack	85/755
NR-Pro 2000T TP / 10-pack	79/625

ASANTÉ

10T HUB 8 Port (8TP + 1BNC)	**(115)*
10T HUB 12 Port (12TP + 1BNC + 1AUI)	**(219)*
Fast 100BaseTX 12 Port Hub, stackable	**(1475)*
Fast 100BaseTX 12 Port PNP	**(1195)*
FriendlyNet 5 Port Hub TP	**(62)*
FriendlyNet 8 Port Hub TP	**(65)*

ASCEND

P25-IU-FX: ISDN Pipeline 25 + 4 Ethernet	**(455)*
P25-IU-PX: ISDN Pipeline 25 + IP Routing	**(525)*
ISDN Pipeline 50 w. UBRI	**(599)*
- w. Secure Firewall P50	add 350

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15. NOTEBOOK / DESKTOP / PALMTOP

ACER

AcerNote Light Multimedia 374+: P-133, 16MB, 1GB, 10X CD, 11.3" TFT	2795
Nuovo 971: P-133Mhz, 16MB, 1.3GB, 6X CD, 28.8 modem, 11.8" TFT	3495
Nuovo 972: P-133Mhz, 16MB, 1.3GB, 6X CD, 28.8 modem, 11.3" DSTN	3095
Nuovo 975: P-166MMX, 32MB, 2GB, 10X CD, 33.6 modem, 12.1" TFT	4595

ALCOM (Samsung oem)

FX-220: P120, 16MB, 1GB, 11.3" DSTN	**(1499)*
FX-250: P133, 16MB, 1.3GB, 10X CD, 11.3" DSTN	1799
XL-322: P120, 16MB, 1GB, 10X CD, 12.1" TFT	2295
XL-353: P133, 16MB, 1.3GB, 10X CD, 12.1" TFT	2395
XL-380: P150, 32MB, 2.1GB, 10X CD, Li-Ion, 12.1" TFT	2895

CHEM USA

ChemBook 2600: 16MB, 1.4GB, 10X CD, Zoom Video Ready, Win'95, 12.1" DSTN,	
- P133/ 166	1895/1995
- P166MMX	2095
- P200MMX	2295
Upgrades:	
- to 12.1" TFT	add 500
- to Li-Ion Battery	add 100
- to 2GB Hard Drive	add 150
ChemBook 6800: 16MB RAM, 1GB, 11X CD, 12.1" DSTN, 3 PCMCIA slots, w. P100/ 133/ 166/ 200Mhz	1795/1845/1995/2095
ChemBook 6800: 16MB, 1.3GB, 11X CD, 12.1" TFT, w. P133Mhz / P166Mhz / P200Mhz.	2450/2575/2675
w. P166MMX	2675
- Internal Battery / External Battery	85/150
- upgrade Li-Ion Battery	add 100
ChemBook 9750: 16MB RAM, 1GB, 10X CD removable 12.1" DSTN, video jack,	
- P100Mhz / P133Mhz	1795/1845
- P166Mhz / P200Mhz	1975/2075
- upgrade (for 9750) to 12.1" TFT	add 700
Chembook 9750: 16MB RAM, 2GB, 10X CD, 12.1" TFT, Li-Ion Battery, w. P166Mhz / P200Mhz	2825/2899
- w. P166MMX / P200MMX	2899/3095
- w. 32MB RAM built-in	add 150
- upgrade (fr. 12.1" TFT) to 13.3' TFT	add 675

EVEREX

48 hr. nationwide manufacturer direct service

StepNote MX133: 16MB RAM, 1.3GB, 10X CD, Win'95, MS Bundle,	
- w. 12.1" DSTN / 11.3" TFT	1795/2295
Upgrade to 2.1GB HDD	add 165

FUJITSU

Lifebook 530T: P133, 16MB, 1GB, 6X CD, 11.3" TFT	2695
Lifebook 555T: P150, 16MB, 1.3GB, 6X CD, 12.1" TFT	3450
Lifebook 635T: P133, 16MB, 1.3GB, 28.8 modem, 12.1" TFT	3350
Lifebook 655TX: P150MMX, 16MB, 1.3GB, 33.6 modem, 12.1" TFT	**(3895)*
Port Replicator Enhanced Unit for 635 & 655	355

HITACHI

C-133T: P133, 8MB, 1GB, 8X CD, 28.8 modem, 12.1" TFT	1965
E-133TC: P133, 16MB, 1GB, 8X CD, 11.3" TFT	1999
MX-133T: P133, 16MB, 1.3GB, 8X CD, 33.6 modem, 12.1" TFT	**(2595)*
MX-166T: P166MMX, 16MB, 2.1GB, 8X CD, 33.6 modem, 10BT, 12.1" TFT	**(3545)*

HP

we're Authorized VAR

LAPTOP:

Omnibook 800CS/100 (F1171A): 16MB RAM, 772MB, 10" DSTN	2395
Omnibook 800CT/133 (F1175A): 16MB RAM, 1.3GB, 10.4" TFT	3195
Omnibook 800CT/166MMX (F1360A): 16MB RAM, 2GB, 10.4" TFT	4595
Omnibook 5500CTS/120 (F1324A): 16MB RAM, 1.3GB, 16-bit Sound, 10.4" TFT	**(2295)*
Omnibook 5700CT/150MMX (F1352A): 16MB, 2GB, 12.1" TFT	4445
Omnibook 5700CT/166MMX (F1353A): 16MB, 2GB, 12.1" TFT	4695
Upgrades: 10X CD Rom (F1347A) for 2000 / 5500 / 5700	335

DESKTOP:

** monitor sold seperate **

Vectra VL4/133 (D4660B): P-133Mhz, 2.5GB, 16MB, Mini-Tower, HP Keyboard & Mouse	**(995)*
Vectra VL5/166MT (D4579A): P-166Mhz, 16MB RAM, 2.5GB, 8X CD,Win'95,HP Keyboard & Mouse	**(1595)*
Vectra VL5/200MT (D4577A): P200Mhz, 16MB, 2.5GB, 8X CD, Win'95, HP Keyboard & Mouse	1765
Vectra XA6/200MT: (D4776N): Pro-200Mhz, 32MB, 2.5GB, 8X CD, 10/100 Ethernet, Win NT 4.0, HP Keybaord & Mouse	2565

PALMTOP:

200LX 80 column 2MB (F1061A)	459
200LX 80 column 4MB (F1216A)	549
300LX 2MB, 640 x 240 (F1220A)	465
320LX 4MB, 640 x 240 (F1321A)	645

IBM

TP365X: P-133Mhz, 8MB, 1.08GB, 11.3" DSTN	1495
TP365XD: P-133Mhz, 8MB, 1.35GB, 4X CD,	
- w. 11.3" DSTN	1850
- w. 11.3" TFT	2695
TP560: P-133Mhz, 8MB, 2.1GB, 12.1" TFT	3795
- w. 11.3" DSTN	2395

ThinkPad
760

TP760ED: P-133Mhz, 16MB, 2.1GB HDD, 6X CD, 12.1" TFT	4395
TP760EL: P-120Mhz, 8MB, 1.08GB, 12.1" DSTN	Call
TP760EL: P-133Mhz, 32MB, 2.1GB, 12.1" TFT	5095
TP760XD: P-166MMX, 32MB, 3GB, 8X CD, 28.8 modem, 12.1" TFT	6295

KEYTECH USA

KB6280: 16MB, 1.3GB, 12.1" TFT, 11X CD,	
w. P166Mhz / P200Mhz	2425/2495
w. MMX-166Mhz / MMX-200Mhz	2495/2725
KB6280: 16MB, 1.3GB, 11X CD, 12.1" DSTN,	
w. P166Mhz / P200Mhz	1885/1975
w. P166MMX / P200MMX	1965/2195

MAXTECH

753TS: 8MB RAM, 1.3GB, 8X CD, 11.8" TFT, support TV video, w. P133Mhz / P166Mhz	2125/2295
Upgrade to 12.1" TFT	add 280

RIX

AP6400: 16MB, 1.3GB, 11X CD, 12.1" TFT,	
- P133Mhz / P166Mhz / P200Mhz	2495/2595/2695
Upgrades: - 32MB built-in	add 125
- w. Win'95 loaded	add 90
822: P-133Mhz, 16MB, 1.3GB, 6X CD, Win'95,	
w. 11.3" DSTN	1665
w. 11.3" TFT	1995

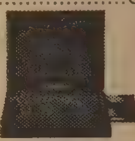
SCEPTRE

S3900: 8MB, 1GB HDD, 11.3" DSTN, Win'95,	
- P100Mhz / P133Mhz / P150Mhz	1495/1665/1745
S4000: 8MB, 1GB, 10X CD, 12.1" TFT, Win'95, Li-Ion,	
- P100Mhz / P133Mhz / P150Mhz	2395/2585/2655
S4500: P-166MMX, 16MB, 12.1" TFT,	
- 1GB / 1.3GB / 2GB HDD	3395/3445/3655
Upgrades: - 1.3GB HDD / 2GB HDD	add 95/250
- w. 16MB built-in	add 75
- w. 32MB built-in	add 195

TOSHIBA

Portege 650CT: P-133Mhz, 16MB, 1.3GB, 28.8 modem, 11.3" TFT	Call
Portege 660CDT: P-150Mhz, 16MB, 1.35GB, 10X CD, 28.8 modem, 11.3" TFT	Call
Satellite 110CS: P-100, 8MB, 810MB, 11.3" DSTN	1245
Satellite 200CDS: P-100Mhz, 8MB, 810MB, 6X CD, 11.3" DSTN	1545
Satellite 425CDT: P-100, 8MB, 810MB, 6X CD, 11.3" TFT	1999
Satellite 430CDS: P-120, 16MB, 1.26GB, 10X CD, 11.3" DSTN	1795
Satellite 430CDT: P-120, 16MB, 2.02GB, 10X CD, 11.3" TFT	2295
Tecra 500CDT: P-120, 16MB, 1.2GB, 12.1" TFT, 6X CD, 28.8 modem	2945
Tecra 500CS: P-120, 16MB, 1.2GB, 12.1" DSTN, 28.8 modem	1750
Tecra 510CDT: P-133, 16MB, 2.1GB, 12.1" TFT, 10X CD, 28.8 modem	3385
Tecra 730XCDT: P-150MMX, 16MB, 1.2GB, 6X CD, 12.1" TFT, 28.8 modem	4795
Tecra 740CDT: P-166MMX, 16MB, 3GB, 10X CD, 28.8 modem, 13.3" TFT	Call

TWINHEAD



Slimnote 700C: 11.3" DSTN, 1GB HDD, Win'95, 16MB,	
- w. P-120	1199
- w. P-133	1299
Slimnote 700T: P-133, 1.2GB, 16MB Win'95, 11.3" TFT.	1495
Slimnote 700PCMCIA 10X CD Ext	315
Slimnote 9133T: P-133, 12.1" TFT, 10X CD, 33.6 modem, Win'95, Lithium Ion Battery,	
- w. 1.3GB HDD / 2.1GB HDD	2799/2999
Slimnote 9133V: P-133, 11.3" DSTN, 1.3GB 16MB RAM, 10X CD, Win'95	1945
- w. built-in modem	add 175
- w. 16MB RAM add-on	add 195
- w. 11.3" TFT	add 525
- w. Lithium Ion Battery	add 100
Slimnote 9150T: P-150, 12.1" TFT, 32MB RAM, 2.1GB, Win'95, 10X CD, Lithium Ion Battery	3195
Slimnote 9166T: P-166MMX, 12.1" TFT, 2.1GB, 32MB, 33.6 modem, 10X CD, Win'95, Li-Ion	3795
- upgrade to LCD 1024x768	add 300

US ROBOTICS

Palm Pilot Personal 512k	279
Palm Pilot Prof. 1MB	369
- Belt Crib Case	24
- Cradle for Windows	29
- Deluxe Leather Case	58
- Palm Pilot Modem	129
- Pen 3-pk	7.99
Pilot 1000 Pocket Organizer	**(199)*
Pilot 5000 Pocket Organizer	**(235)*
- 1MB upgrade	**(99)*
- Cable for MAC / Pen 3-pk	25/7.95

ACCESSORIES

Kensington: MicroSaver	39.95
Port: DEFCOM I (motion-sensor)	49
Targus: Carrying Case	from 29.95

NETWORK (con't)

ISDN Pipeline 75 w. UBRI	**(675)*
- w. Secure Firewall P75	add 350
ISDN P130-UBRI-FT1	**(1295)*
- w. Secure Firewall P130	add 690
MAX200+ (M201 - 4BRIU)	2975
MAX1800 (MX18 - 8BRIU)	**(4995)*

Bay Networks

AT2202001 Bay Stack 100BT 12 Port	1595
CG1001E01 Bay Stack 12 Port	599
CG1001E02 Bay Stack 24 Port	975
Lattislink 2800A: 16TP + 1AUI	559
Lattishub 2803: 16TP + 1AUI Stackable	599
Lattisswitch 28115R 10/100 TP 16 Port	7795

CASTELLE

FaxPress 1500N Ether 1 Line for NW & NT	1995
Office Connect Ether 2P Printer Server	359
Office Connect Ether 1 Line Fax Server	1195

CHEYENNE

Arc Serve 6.0 for Win - 5 to 25-user (netware)	**(395)*
- upgrade Workgroup edition	239
Arc Serve 6.0 for Win - 50 to 1000-user	1095
- upgrade Workgroup edition	415
Arc Serve 6.0 for Win NT 4.0 Single Server	**(435)*
Arc Serve 6.0 for Win NT 4.0 Enterprise	**(745)*
Arc Serve 6.0 for Win NT Workstation	185
Arc Serve for Mac - 5 / 20-user	159/309
Arc Solo Backup s/w for Dos / for Win	119/118
Fax Server NLM 3.01 - 5 / 10 / 25-user	355/639/999
Inoculan for Netware Server 4.0 Unlimited	585
Inoculan for Win'95 (Anti-Virus)	45
Inoculan for Win NT Server	575
Inoculan for Win NT Workstation Client	46

CISCO

CPA-202 Personal Office ISDN - BRI w. NT1	425
CPA-751 ISDN BRI	625
CPA-751RO ISDN BRI Remote Office	995
CPA-2514 Router	2195

CNet (Advanced Network)

930 PCI PNP Full Duplex	**(29)*
2000E + PNP ISA Combo	27
4020ERP 2 Port Coax Repeater	165
8800TPC HUB: (8TP + BNC)	**(79)*
8816TPC HUB: (16TP + BNC)	**(159)*

DANPEX

2900P2 PCI Combo	**(39)*
3270 Emulation for PC / for PS/2	175/195
5250 Emulation for PC / for PS/2	199/235
6200P2 PCMCIA (type II) BNC+TP	115
7000P3 32bit VLB Combo	**(75)*
9400P3 32bit PCI Combo (DEC, full duplex)	**(69)*
EN-1600 16 Port HUB R.M.	**(175)*
EN-2400 24 Port HUB R.M.	335
ER-200 2-port Repeater Coax	185
ER-400 4-port Repeater Coax	299
ET-509 Translator (UTP to BNC)	109
ET-510 Translator (UTP to AUI)	107
FE-1000TX ISA 10/100BaseTX	**(98)*
FE-1400TX PCI 10/100BaseTX	**(99)*
Print Server (2P 1S) NW / Unix / Appletalk	**(235)*
TR-4016 Token Ring ISA	269

DIGI INTERNATIONAL

IMAC Bridge 1 ISDN	1165
IMAC Bridge Dual IMAC	1595
PC IMAC - ISA: Server, 1 ISDN	525
PC IMAC / 4-1: Multi-ISDN Expansion	665

FARALLON

Mac & PC Connection products	Call

FRONTIER

Super TCP / SuperWeb	Call

FUJITSU

PCMCIA Ethernet TP	135
PCMCIA Ethernet Combo	179
PCMCIA Ethernet TP + SCSI	295

HEWLETT PACKARD

Advanced Stack 8 Port HUB (J2610B)	245
Advanced Ethernet Hub 8E (J3128A)	185
J2550B Jet Direct TP	299
J2552B Jet Direct Combo	345
J2573A 10/100 VG Selectable ISA	169
J2585B 10/100 VG Selectable PCI	135
J2590A Jet Direct EX Plus 3 for 100VG	549
J2591A Jet DirectEX Plus Combo	295
J2593A Jet DirectEX Plus 3 Combo	439
J2980A Advance Stack 10/100 Lan Switch-16	5295
J3200A Advanced Switching 12 Port	425
J3201A (J3200A) + SMNP (J3210A)	**(499)*
J3202A Advanced Switching 24 Port	825
J3203A (J3202A) + SMNP (J3210A)	**(899)*

NETSERVER :

We are Authorized Reseller of HP SERVER

D4311B LX Pro 6/200	13499
D4840A LH Pro 6/200	5799
D4877A E30 5/166	2199
D4933A E40 6/200 Pro	2650
D4946A LD Pro 6/180	4245

IBM

Token Ring 16/4 Turbo ISA (72H3482)	245
Token Ring PCMCIA 16/4 Auto	349

intel.

EE11TX 12 Port 10 & 100 Dual Speed Hub	1065
- bundled with 10 of PILA 8465B	**(1665)*
ES100-TX Switching Hub	3395
EILA 8225 EtherExpress 32 Flash EISA Combo	219
EILA 8265 PRO/100 for EISA	**(199)*
EtherExpress Pro 10 bit cards :	
- PCLA 8210 BNC+TP oem / reg / 5-pk.	**(69/95/385)*
- PCLA 8220 TP oem / reg / 5-Pack	**(59/89/315)*
- PCLA 8205 Flash BNC+AUI+TP	135
- PCLA 8215 Flash BNC + TP	125
- PCLA 8225 Flash TP	*115*
LANdesk Virus Protect 4.0	945
LANdesk Workgroup Manager 25 Node (LEWMV10)	559
MBLA 1600 PCMCIA 10/100	**(159)*
PCLA 2451 Netport Express Pro/100 Ext	359
PCLA 3151 Netport Express Pro Int.	295
PILA 8465B PRO/100 PCI TP oem / 5-Pack.	**(69/375)*
PILA 8500 PRO/10 PCI Combo oem	**(85)*
PILA 8520-TPO PRO/10 PCI oem	**(69)*

KINGSTON

Etherx 10/100 Fast PCI	74
Etherx 10BT PC Card	95

LANPRO

EN2000PXA PNP Full Duplex Combo	**(29)*
- w. Novell Personal Netware	**(54)*
EN5100 PCI Combo	79
EN5200PX PCI Combo	**(39)*
EP3020A Pocket Combo	99
Fast 100 HUB 8 Port / Stackable	*(459)/499
Fast 100 HUB 12 Port	**(599)*
HUB : 5 Port (5TP)	**(59)*
HUB : 8 Port (8TP + BNC)	**(75)*
HUB : 16 Port (17TP + 2AUI + 2BNC)	**(175)*
SD200 2 Port Easy Switch 10 BT & 100TX	445

LINKSYS

Fast 100TX 4 Port Hub Stackable	**(269)*
Fast Switch 10/100 TX 2 Port	395
Fast Switch 10BT & 100TX 5 Port	1795

MEGAHERTZ

XJ10BC PCMCIA Ethernet Combo	**(165)*
XJ10BT PCMCIA Ethernet TP	**(125)*
XJEM 3336C Modem 33.6 + Lan Combo	325
XJEM 3336T Modem 33.6 + Lan TP	299

MICRODYNE (Eagle)

EH800E 8 Port HUB	**(119)*
EH1200E 12 Port HUB	**(175)*
NE 10/100 ISA	**(89)*
NE 10/100 PCI	119
NE2000+ TP / 5 pack	**(75/329)*
NE2000+ Combo / 5 pack	**(85/399)*
NE2500 Combo, plug & play oem	**(35)*
NE5500 32 bit PCI Combo	**(109)*

MICROTEST

CD-Now for Netware: 25-user / 50-user	489/695
Disc View Pro	265
Disc Serv (includes Disc View)	529

NOVELL.

Intra NetWare 4.11:	
- 5 / 10 / 25-user	625/1250/2095
- 50 / 100-user	2895/3995
- 250 / 500 / 1000-user	7295/15995/30995

**(price) .... SPECIALS , while supplies last*

Intra Netware for Small Business :	
- Server + 5 License	599
- 1 / 5-user license	59/225
Intra Netware Kit for Small Business: (server + 5-user + 2 Danpex ISA Combo + 5 port 10BT hub)	629
Lan Workplace 5.0 single / 10-user	195/1295
Netware 3.12 (3.5" FD)	
- 5 / 10 / 25-user	**(675/1295/1895)*
- 50 / 100-user	2695/3495
Netware Connect 2 Ports / 8 Ports	355/1375
Netware Connect 32 Ports	3895
Netware NFS v1.2C	2850
Netware NFS Service 2.1	2195
NFS Client for Lan Workplace	205
Unixware Personal Edition v2.01 - CD version	**(99)*
Unixware SDK v2.1 - CD version	**(75)*

PALINDROME

Network Archivist NLM 3.1A Backup	**(195)*

SHIVA

LanRover/2E Plus 3.5 Async TP v.34	1695
NetModem/E 28.8 Ether BNC + TP	1295

SMC

Ether EZ Combo	115
Ether EZ TP (8416T) oem	**(65)*
Elite Ultra 32 EISA Combo	**(195)*
Etherpower PCI TP (8432T) oem	**(69)*
Etherpower PCI Combo oem	**(85)*
Etherpower PCI 10/100 (9332BDT) oem	**(74)*
EZ Hub 100TX 8 Port	635
Tiger HUB: 100TX 12 Port	1195
Tiger HUB: 3212TC (12TP + BNC + AUI)	349
Tiger HUB: 3314T 14 Port	**(459)*
Tiger Switch XE 24 Port	6895

WISECOM (5 yr warranty)

D300CT PCI Bus Mastering	**(39)*
H008CAT 8 Port HUB (8TP + AUI + BNC)	**(85)*
HI16CAT 16 Port HUB (16TP + AUI + BNC)	155
P200CT 16 bit ISA Combo, plug & play	26
R300CT PCI 32 bit Combo, plug & play	34

XIRCOM

CE3-10BC PCMCIA Combo	**(159)*
CE3-10BT PCMCIA TP	**(125)*
CE3-100BTX 10/100 PCMCIA	**(149)*
CEM33-BC 33.6 Modem + Lan Combo	**(309)*
CEM33-BT 33.6 Modem + Lan TP	**(275)*
PE3-10BC Pocket Adapter Combo	**(279)*
PE3-10BT Pocket Adapter TP	**(259)*

CABLES & ACCESSORIES :

10BaseT, Cat. 3 plenum 1000'	165
Belden 8259, RG58 1000'	165
RG58 U 500' / 1000'	59/99
RG58 A/U 500' / 1000'	75/129
Twisted Pair 2-pair, PVC, Cat. 3:	
- 500' / 1000'	45/59
Twisted Pair 4-pair, PVC, Cat. 3:	
- 200' / 500' / 1000'	35/55/89
Twisted Pair 4-pair, PVC, Cat. 5: - 500'	69

Custom-made Cables, Cross-Overs available call

16. POWER SUPPLY

APC

BF-250 Back-UPS Office Kit	135
BK-280 Back-UPS (200W), 2 out	105
BK-400 Back-UPS (300W), 2 out	154
BK-450 Back-UPS (325W), 4 out	179
BK-600 Back-UPS (425W), 4 out	239
BK-900 Back-UPS (650W), 6 out	345
BP-280 Back-UPS Pro PNP, 2 out	159
BP-420 Back-UPS Pro PNP, 4 out	235
BP-650 Back-UPS Pro PNP, 4 out	289
BP-1000 Backup Pro, 6 out	375
SU-450 Smart-Net (486, 586 WS), 4 out	295
SU-700 Smart-Net (486, 586 FS), 4 out	365
SU-1000 Smart-Net (FS & WS), 6 out	495
SU-1400 Smart-Net (950W), 6 out	625
SU-2200 Smart-Net (1600W), 8 out	1095
SU-3000 Smart-Net (2250W), 8 out	1675
SUVS-420 Smart Value Server, 4 out	239
SUVS-650 Smart Value Server, 4 out	295
SUVS-1000 Smart Value Server, 6 out	415
PowerChute Plus :	
- for Novell	65
- for OS/2, Lan Server, 3 Com	75
- for Unix / Xenix	99
- for Win & Win'95	55
- for Win NT	69
Surge Arrest (PER 7)	17.99
Surge Arrest w. TEL (PER 7T)	22.99
Surge Network Strip (NET 7)	29.95
Surge Protector (P7)	9.99

PC POWER COOLING

CPUcool for 486 or 586-75 / 133 (1.9")	18.95
CPUcool for 586-150 / 200 (1.9W)	19.95
CPUcool for Pentium® Pro (3.2")	22.95
Silencer Slim 230 for Baby or Mid Tower	69
Silencer 230 Full Tower	89
Silencer 270 for Full Tower	124
- Slim for Baby or Mid Tower	114
Silencer 235 for ATX	84
Silencer 275 for ATX	124
Standard 230 for Full Tower	85
Turbo Cool 300 for ATX	126
Turbo Cool 300 for Full Tower	125
- for Slim (baby or mid tower)	115
Turbo Cool 400 for Full Tower / for Slim	**(176/175)*
Turbo Cool 400 for ATX	199
Turbo Cool 450 for Full Tower (heavy duty)	285
Two-inOne 500 (slim, redundant)	215
Twinpower 900 (redundant)	895

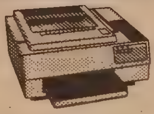
OTHERS

235W for ATX	49
250W for Baby or Mid Tower	29
250W for Baby or Mid Tower, PS/2 (by Kingspao)	45
300W UL for Full Tower , PS/2	49
300W for Full Tower, PS/2 (by Kingspao)	59
RPT-600 300W Redundant for Tower	179

ACCESSORIES

Battery Tester M-032	6.50
Belkin Power Authority F5C120	**(17.95)*
DMM: DT-890B (A,V,O,C,Hfe)	19.95
DMM: DT-830B (Adc,V,O,Hfe) pocket size	8.95
DMM: M-3900 (A,V,O,Hfe) big LCD	17.95
DMM: ST-5308 (Adc,V,O,Hfe) battery test	11.95
DMM: KT-7113 (A,V,O,C,Hfe) auto ranging	24.95
DMM: KT-7244 (A,V,O,F,Hfe)	21.95
Engine Tester KT-7181 (Dwell, Tacho)	18.95
Pocket Meter MF-133, 5 functions	6.95
Power Center Switching Systems	13.50

17. PRINTER / PLOTTER



Printer memory available. Please call for $

BROTHER

HL-720 True 600dpi, 6ppm, Laser	355
HL-730DX True 600dpi, 6ppm, Laser	425
HL-1660 17ppm, Laser, 1200x600dpi	1225
MFC-4550 5-in-1, 600dpi, Laser, Fax	785
MFC-6550 6-in-1, fax/ copy/ scan/ print etc.	999

CANON

BJC-70 Color, 720x360dpi, 346cps	**(299)*
BJ-240 Color, 360x360dpi, 4ppm	189
BJC-620 Ink Jet, Color, Par, 720dpi	**(339)*
BJC-4200 Ink Jet Color, 360x720dpi	275
BJC-4550 11" x 17", 5ppm, 720x360dpi	475

EPSON

FX-870 9-pin	295
FX-2170 9-pin, Wide (max. 6 copies)	449
LQ-570 Plus 24-pin	259
LQ-870 24-pin, Par	455
LQ-2070 24 pin, Wide	**(389)*
LQ-2170 24-pin, Wide	549
Stylus 400 Color, 3ppm, 720dpi	235
Stylus 600 Color Inkjet, 720x1440dpi	289
Stylus 800 Color, 8ppm, 720x1440dpi	419
Stylus 1500 720dpi, fit A - C size paper	759
Stylus Pro XL, Postscript	*1695*

Accessories :

Black Ink for II & IIS	19.95
Color Ink for II & IIS	29.95
Black Ink for Stylus 400/ 500/ 600	21.95 ea
Blakc Ink for 400/ 800 (SO20025)	12.95
Black Ink (premium quality) for 800/1520	24.95
Color Ink for Stylus 400/ 600/ 800	24.95 ea
Coated Letter Paper 720dpi (S041062), 100 sheet	13.95
High Quality A4 Paper (S041111) , 100 sheet	9.50
Photo Quality A4 Paper (S041061), 100 sheet	12.95
Photo Quality glossy (S041124), 20 sheet	10.95

HEWLETT PACKARD

Color Laser Jet 5 (C3961A)	3875
Color Laser Jet 5M (C3962A)	4945
Desk Jet 692C	**(275)*
Desk Jet 820CXi / 870CXi	*(295)/479
Desk Jet 1000CXi (C2673A), print size 4x5 - 11x17	485
Desk Jet 1600C PC, Mac	1299
Desk Jet 1600CM Postscript PC, Mac	1899
Laser Jet 4V / 4MV (B size)	1795/2595
Laser Jet 5	999
Laser Jet 5M / 5N	1595/1285
Laser Jet 5Si / 5SiMX	2349/3395
Laser Jet 6LXi	389
Laser Jet 6PXi / 6MP	745/879
Mopier C4176A 5Si Bundle	6545
Office Jet 330 4-in-1, print/ fax/ scan/ copy	**(469)*
Office Jet 590	595
Office Jet Pro 1150C Color (C5300A)	939
Portable 340 ($50 Rebate)	285

PLOTTERS

Design Jet 350C: D Size / E Size	2195/2795
Design Jet 750C: D Size / E Size	4995/5695
Design Jet 755CM: E Size	8195

Accessories :

C3067A: Color Kit for 540	**(37)*
C3169A: Postscript for 5Si	435
C3760A: Lower Cassette for 4V / 4MV	325
C3762A: Duplex for 5Si / 5SiMX	479
C3765A: Envelope Feeder for 5Si	379
C3918A: Postscript for 5 / 5N	335
C3920A: Duplex for 5 / 5N / 5M	475
C3921A: 500 Sheet Feeder for 5	225
C3927A: Power Envelope Feeder for 5	259
C4533A: Color Kit for 600	**(39)*

Ink Cartridges :

(HP51626A) Black for 500, 540, 560	24.45
(HP51625A) Color for 500C, 550C, 560C	26.95
(HP51629A) Black for 600, 660	24.95
(HP51649A) Color for 660C	29.25
(HP51645A) Black for 870C, 855C, 1600C	26.95
(HP51641A) Color for 870C, 855C, 1600C	28.95
(HP51640A) Black for 1200C	23.95
(HP51640C) Cyan for 1200C	27.95
(HP51460M) Magenta for 1200C	27.95
(HP51640Y) Yellow for 1200C	27.95
(HPC3105A) Black for Color Laser Jet	7.95
(HPC3102A) Cyan for Color Laser Jet	32.95
(HPC3104A) Magenta for Color Laser Jet	32.95
(HPC3103A) Yellow for Color Laser Jet	32.95

Paper:

92296T: Transparency Film for Laser, Letter, 50 sheet	18.95
C1812A: Greeting Card, Letter, 20 sheet	11.95
C1846A: Photo Paper, Letter, 20 sheet	10.95
C2974A: Glossy, Letter for 5/ 5M, 50 sheet	41.95
C5973A: Premium Glossy, Letter, 25 sheet	22.95
C5976A: Bright White Inkjet, Letter, 200 sheet	6.95

Toner Cartridges :

(HP92295A) Toner for II, IID, III, IIID	75
(HP92275A) Toner for IIP, IIP+, IIIP	74
(HP92291A) Toner for IIISi, 4Si, 4SiMX	129
(HP92298A) Toner for 4, 4M, 4+, 4M+, 5, 5N, 5M	89
(HP92274A) Toner for 4L, 4ML, 4P	65
(HPC3900A) Toner for 4V, 4MV	139
(HPC3906A) Toner for 5L, 5ML	59
(HPC3903A) Toner for 5P, 5MP, 6P, 6MP	75
(HPC3909A) Toner for 5Si, 5SiMX	179

IBM (network printer)

#4312001: Laser, 12ppm, 600dpi, 4MB	1025
#4317001: Laser, 17ppm, 600dpi, 4MB	1365
#4324001: Laser, 24ppm, 600dpi, 4MB	2345

LEXMARK

Optra C 600dpi, 3ppm color, Postscript, 8MB	4695
Optra E 600dpi, 6ppm, 1MB	395
Optra LX+ 1200dpi, 16ppm, Par, Postscript, 4MB	1895
Optra LXiV+ 1200dpi, 16ppm, 8MB, Postscript, w. Ethernet Combo	2595
Optra R+ 1200dpi/8ppm, Ser & Par, 2MB, Postscript, 600dpi/16ppm	1295

MICROTEK

TrueLaser MTP-306 35 fonts, 6ppm, 2MB	**(599)*

NEC

Superscript 860 Laser	**(379)*

OKIDATA

ML184T 9 pin, Par (max. 5 copies)	235
ML320T 9 pin (max. 5 copies, 290cps)	**(325)*
ML390T 24 pin, 312cps, for Win & Win 32	345
ML520 9-pin, 430cps	**(385)*
ML590 24-pin (max. 5 copies)	449
ML591 24-pin, Wide (max. 5 copies)	625
OkiJet 2010 Color, 600dpi	**(199)*
OkiPage 4W Laser 4ppm	**(289)*
OL600E Laser, 6ppm, 600dpi	389
OL610E Laser, 6ppm, 600dpi, 2MB	485
OL610e/PS Laser Postscript	**(725)*
OL810E Laser, 8ppm, 600x1200dpi	665
OL1200 Laser 12ppm, 600x600dpi, 2MB	**(949)*

PANASONIC

3123 24 pin, Quiet, Scalable Fonts	259

Accessories:

Color upgrade Kit KX-PCK11	55
Serial Interface Card PS-13	89

SEIKO

Smart Label Printer EZ30	145
Smart Label Printer Pro	235
Standard Label (2 rolls)	7.95

SUMMAJET (Plotter)

1324C Color A - D Size	2250
1324M Mono A - D Size	1990
1336C Color A - F Size	2695
1336M Mono A - F Size	2465
D Size Stand / E Size Stand	325/365

OTHER ACCESSORIES

Auto Switch (non-power) 2 to 1	11.50
Auto Switch (non-power) 4 to 1	22.50
Data Switch: 2 Way / 4 Way	5.99/8.99
Parallel Auto Switch 2 to 1 bi-directional	19.95
Parallel Auto Switch 4 to 1 bi-directional	29.95

18. PROJECTOR

3M, NEC

projection products	Call

PROXIMA

Desktop DP2810 LCD 8.4" 33mm 640 x 480	3850
Desktop DP5100	5850
Ovation 810 LCD 8.4" 2M Color, 640 x 480	2065
Ovation 920 10.4" LCD 16.7M 1280 x 1024	8150
Ovation + 840 8.4" LCD 16.7M 800 x 600	2995
Ovation + 846 10.4" LCD 16.7M 800 x 600	3895
Portable Overhead A653 3000 Lumens	475
Portable Overhead A655 4000 Lumens	799

19. SCANNER

ACER (flatbed)

AcerScan 300F Color	**(199)*

AVISION

AV100 Color	195
AV360C Color	199

DELRINA

WinFax Pro Scanner	**(299)*

HEWLETT PACKARD

ScanJet 4C Color & Gray Scale w. Kit	749
- Auto Document Feeder (C2525B)	475
- Transparency (C2521B)	635
Scanjet 5P Color/ Grayscale	385

LOGITECH (hand)

Page Scan Color	**(295)*
Scanman Color + PhotoShop L.E.	189

MICROTEK (flatbed)

Scan Maker III w. TMA & Photoshop OCR	**(1399)*
Scan Maker E3 600dpi, 24-bit Color, w.OCR.	**(195)*
Scan Maker E6 1200dpi, w. OCR	**(339)*
Scan Maker E6 Pro 1200dpi w. Photoshop OCR.	529
Slide Maker 35T 1800dpi, 16.8M Color, w. ScanWizard	725
Transparency Adapter for E3	285
Transparency Adapter for E6	285

QTRONIX

Sagitta Color LE (hand)	99
Sagitta Desk Pro	105
Sagitta Gray (hand)	47

STORM TECHNOLOGY

Easy Photo Drive ISA Card	179
Easy Photo Reader Parallel	155
Easy Photo Smartpage Color	259

UMAX

600S w. Photo Deluxe	245

VISIONEER

PaperPort MX for Win (HP4S design)	**(225)*
PaperPort IX Scanning Keyboard	185

20. TAPE BACKUP

EXABYTE

Eagle TR3 (603003-000) 3.2GB w. accel card Int	245
Eagle TR3 (603003-004) 3.2GB Int w/o card	**(145)*
EXB-8205XL 8mm Dat. 3.5 - 7GB Int / Ext.	1275/1499
EXB-8505XL 8mm Dat. 7 - 14GB Int / Ext	1850/2095
EXB-8700E 8mm 7 - 14GB Ext	Call
EXB-8700LT 8mm 5 - 10GB Ext	Call

HEWLETT PACKARD

C1534 4mm Dat. 2GB SCSI Int	**(549)*
C1536 4mm Dat. 2-4GB SCSI Int	**(595)*
C1554 Dat. 24GB DDS-3 Int	1345
C1599 Dat. 8GB DDS-2 Int	785
C1561A Autoloader Surestore 12000E Dat. 48GB	2895
Colorado T1000 850MB Travan w. cartridge Int	**(139)*
Colorado T1000 850MB, printer port Ext	175
Colorado T3000 3.2GB Travan w. cartridge Int	189
Colorado T4000S 4GB Travan Int	359
HP Mounting Frame to 5.25" for C1534/ C1536/ C1599	25
HP Mounting Frame to 5.25" for C1533/ C1554	27

IOMEGA

Ditto 800MB Travan Int	99
Ditto 800MB Travan Parallel	139
Ditto 2GB Int / Ext	129/179
- 2GB Tape / 3-pack	19.95/57
Ditto 3200MB (QIC 3010/ 3020) Int.	209
Ditto 3200MB (QIC 3010/ 3020) Parallel	245

Seagate

CNR-4320RT 2GB Int w. 5.25" rail	675
CNR-4324RP 2 - 4GB SCSI Int.	645
CNR-4326NP 4mm 8GB Dat. SCSI Int 3.5"	815
CNR-4326RP 4mm 8GB Dat. w. 5.25" rail	**(799)*
CNR-4350XT 2GB Ext	685
Tape Stor w. cartridge 420MB Int	139

**(price) .... SPECIALS , while supplies last*

(oem) .... $, bundled with hardware only

http://www.centralcomputer.com for update price & catalog

Tape Stor w. cartridge 800MB Travan Int	139

Software (Arcada):

Back Up for Windows '95	65
Back Up Exec for Netware WS 7.0	98
Back Up Exec for Netware Enterprise 7.11	845
Back Up Exec for Netware Single Server	435
Back Up Exec for Netware 1 Server 25-user	315
Back Up Exec for Win NT Enterprise 6.11	795
Back Up Exec for Win NT Server 6.11	439
Back Up Exec for Win NT Workstation	189

TEAC

FT-3008TR 800MB Travan Int	*(49)

OTHERS

COMBYTE: DP1800EA 800MB Int	135
NOVASTAR: Novaback CD Bundle (multi-platform)	*(59)
WANG: 3400DX 8GB 4mm 5.25" Dat.	*(699)

TAPE CARTRIDGES:

3M - 4mm 90M	7.50
- 8mm 112M	6.95
- MC3000XL (680MB)	26.50
- Travan (800MB) TR-1	27.95
- Travan (1600MB) TR-3 / TR-4	29.95/34.95
EXABYTE - 8mm 112M, 5GB	9.95
- 8mm 160MXL (for XL drives)	15.95
- 18C 8mm Cleaning Cartridge	19.95
- EXMC 3000XL (1GB)	26.95
- MC3000XL (680MB)	21.95
HP - 92283B 4mm 90M (2GB) / 5-pk	8.50/39
- 92283K 4mm Cleaning Tape 2-pk	21.95
- 92300A 4mm 120M (4GB) / 5-pk	19.95/95
- C1517A 4mm 125M (12GB) DDS-3	29.99
- C1572A 4mm 120M Autoloader	119
- Travan for DT-1000 / 2-pk / 3-pk	29.95/54.95/82
MAXELL - 4mm 90M Dat.	*(7.99)
- DC2120 (QIC80)	9.95
- DC2120XL (350MB)	16.95
SONY - 4mm 120M for DDS	25.95
- 4mm 90M for DDS-1	8.95
- QIC-Wide 3010 (850MB)	24.95
- QIC-Wide 3020 (1.7GB)	27.95

21. VGA CARD

ATI

3D Expression 2MB PCI DRAM w. CD game	89
3D Expression 4MB PCI, PC2TV	159
3D Pro Turbo 4MB PCI, PC2TV	179
3D Pro Turbo 8MB PCI, PC2TV	*(245)
All-in-1 Wonder 4MB PCI	*(259)

DIAMOND

Fire GL 1000 4MB PCI	279
Fire GL 1000 8MB PCI	38
Stealth 3D 2400XL 4MB PCI	139
Stealth 3D 3240XL 2MB PCI VRAM	159
Stealth 3D 3400XL 4MB PCI VRAM	189
Stealth 3D Monster 4MB PCI	189
Stealth 2500 1MB DRAM PCI	49
Stealth 2500 2MB DRAM PCI	65
Stealth Video 64 2MB VRAM PCI, upgradable	119

IMS

TwinTurbo 128P PCI VRAM w. 2MB / 4MB	195/295
TwinTurbo 128P PCI VRAM 8MB	435

LEAKTEK

M-Mate Pro II (external video encoder)	99
Winfast 280 VGA & MPEG-1 w. 1MB / 2MB	145/165
Winfast 430 VGA 2MB VRAM	135

MATROX

Millenium PCI 2MB	159
Millennium PCI 4MB oem / reg	*(185/195)
- upgrade 2MB / 4MB	85/149
- upgrade 6MB oem	*(199)
Mystique 3D PCI 2MB	*(119)
- upgrade 2MB	55
Mystique 3D PCI 4MB oem / reg	129/145

NUMBER NINE

FX Reality 332 3D DRAM PCI 2MB	95
FX Reality 772 VRAM PCI 2MB	*(135)
FX Reality 772 VRAM PCI 4MB	*(195)
Imagine 128 Series II 4MB EDO PCI	*(229)
Imagine 128 Series II PCI 4MB VRAM	*(299)
Imagine 128 Series II PCI 8MB VRAM	*(499)

SPIDER

Tarantula 3D DRAM PNP w. 2MB / 4MB	75/99
Tarantula 64 MK II 2MB VRAM PCI	105
Tarantula 64 MK II 4MB VRAM PCI	135

OTHERS

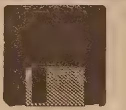
Boca Voyage Movie Player Accelerator VGA	285
Hercules Dynamite 128 PCI 4MB SMDRAM	*(119)
Movie Plus 1100 MPEG Decoder	199
Televiewer / Televiewer Plus	139/189
Trident 8900 1MB ISA	45
Trident 9680 1MB PCI	39
Trident 67TV 3D 2MB EDO DRAM PCI, w. 9685	75
Tvator Pro PC/MAC VGA to NTSC Scan Converter	159
Tvator Remote Pro VGA to NTSC Scan Converter	289
V-Mate Pro (video encorder : PC to TV)	189

Conferencing & Video:

AGFA: Ephoto 307 Digital Camera	*(275)
Casio QV-100 640 x 480 Camera	599
Epson PC Color Digital Camera	395
Epson Photo PC-500 Color Digital Camera	465
- w. PhotoPix LCD Monitor	*(599)
Epson Photo Pix LCD Monitor	175
Howard Video Camera	295
Intel Smart Video Recorder III	189
Internet Videophone + Video Capture	135
Kodak DC20 Digital Camera	199
Kodak DC25 Digital Camera	435
Kodak DC50 Digital Camera Zoom Lens	*(649)
Quick Cam for Win / Quick Cam Color	99/225
Snappy 2.0 (video Snapshot)	195
Specom Suite Visions (color digital camera + s/w)	195
Video Logic Captivator	135
USR: Big Picture Video Kit (capture + modem)	225
USR: Big Picture w. Camera	349

SOFTWARE

1. PC SOFTWARE



ADOBE

Acrobat 3.0	189
FrameMaker 5.11 - CD+FD	545
Illustrator 4.1 for Win & Win'95	*(299)
Illustrator 7.0 for Win 32	365
- competitive upgrade	265
Pagemaker 6.5 for Win 32 / S.E. (special)	545/*(295)
Photoshop 4.0 / S.E. (special)	549/*(399)
Premier 4.2 for Win - FD/CD	*(499)

AUTODESK

Animator Studio 1.1	249
AutoCAD Lite 2.0 / for Win'95	*(255)/409
Autosketch 2.1 for Win & Win'95	89

Borland

C++ 5.0 for Dos, Win, Win32 - CD	325
C++ 5.0 Developer Suite	425
C++ Builder 1.0 Standard / Professional	89/525
Delphi Developer 2 Kit / upgrade	*(395/255)
Delphi 3 / upgrade	499/249
Paradox 5.0 for Win	*(99)
Paradox 7.0 for Win'95 & NT / upgrade	265/95
Turbo Assembly 5.5	115
Visual dBase 5.5 for Win & Win'95	269

COREL

Corel Draw 4.0 (2CD) oem / reg	29/69
Corel Draw 5.0 - CD	*(195)
Corel Draw 6.0 for Win'95 - CD oem / reg	*(59/299)
Corel Draw 7 for Win'95 & NT - CD	*(399)
- upgrade	225
Corel Flow / Corel Flow 3	*(59)/129
Corel PerfecOffice Prof. - CD	275
- upgrade	189
Corel XARA	179
Ventura 7 for Win'95 - CD	549
WordPerfect Suite 3.1 - FD+CD / CD only	265/239
WordPerfect Suite 7.0 for Win'95 - FD+CD	274
- CD only	235

DELRINA

Comm Suite 7.0 for Win'95 - FD / CD	*(95/96)
CyberJack 7.0 for Win'95	*(48)
NetSatisfaxtion 3.0 for Novell 25-user	755
Win Comm Pro	79
WinFax Pro 4.0 - FD / CD	79/89
WinFax Pro 4.1 for Network :	
- 10 / 25 / 50-user	599/1395/2650
WinFax Pro 7.0 for Win'95 - FD / CD	79/79
WinFax Pro Starter Kit (server + 2 notes)	265

IBM

Anti-Virus Desktop 2.5 Single	47
OS/2 4.0 Warp Single : WS / Server	195/539
Voice Type Simply Speaking 3.0.2 for Win'95	74

INTUIT

Quicken Deluxe 6.0 - CD / FD	59/58
Quicken 6.0 for Win3.1 & Win'95	38
Quicken Parent's Guide to Money	16
Quickbook 5.0 for Win - CD	97
Quickbook Prof. 5.0 for Win - CD	185

LOTUS

1-2-3 5.0 for Win	299
1-2-3 97 for Win 32 / upgrade	299/99
cc:Mail 6.1 Systems Pack Server	134
cc Mail 6.0 10-user Client Pack	559
cc:Mail Mobile E-Mail 7.0 for Win'95 & NT	135
Organizer '97 for Win'95	75
Smart Suite 4.0 for Win - CD	*(199)
Smart Suite 97 for Win 32	*(335)
Word Pro '96 for Win3.1 & Win'95	*(65)

MICROGRAFX

ABC Flow Carter 4.0 - CD+FD	299
ABC Graphics Suite Live 6.0 - CD	275
Designer Power Pack - CD	335
Designer Tech Live 4.1 - CD	399
Flowcharter Live 7.0 - CD	279
Graphic Suite #2 for Win'95	315
Picture Publisher Live 5.0 - CD	135
Windows Draw Live 4.0 for Win 32 - CD	24

Microsoft

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Access 2.0 for Win	289
- upgrade for Win'95	94
Access 97	299
Access Developer's Kit for Win'95	459
Back Office Resource Kit pt.1 / pt.2	59/95
Back Office Server 2.5	2295
Back Office Client v2.5 5-user	1199
Dos 6.22	42
- w. Windows 3.11	79
- w. Windows 3.11 Workgroup	95
Excel 5.0 for Win	295
Excel 97 / upgrade	299/95
Exchange Server with 5 Client	899
- w. 10 Client / w. 25 Client	1245/1945
- Internet Connection	459
Fortran Powerstation 4.0 for Win 32	559
Fox Pro 2.6 Single Dos or Win	*(95)
Frontpage 97 / upgrade	139/49.95
Home Essential 97 upgrade	*(94)
Macro Assembler 6.11 (MASM)	155
Multimedia Viewer - CD	*(199)
Office Professional 4.3 - FD / CD	539/559
Office Prof. for Win'95 - FD	525
Office Prof. 97 + Bookshelf - CD	529
- upgrade CD ($40 Rebate)	309
- upgrade + IntelliMouse	335
Office 97 Intergrate Step by Step	19.95
Office 97 Resource Kit	37
Office 97 Small Business Edition	449
- upgrade to S.B. edition	224
Office 97 Standard / upgrade - CD	445/225
PC Mail Server 3.5 w. 10-user	445
- 5-user / 20-user	269/865
Picture-It for Win'95	47
Power Point 7.0 / upgrade	*(299)/98
Project 4.0 for Win / upgrade	415/135
Project for Win'95	419
Publisher 97 CD Deluxe	74
Services for Netware (add-on NT 4.0)	145
SNA NT Server	395
SNA NT Workstation	199
SQL NT Server 6.5 for 5-user	1299
- 10-user / 25-user	1899/3799
- Client License 5-user / 20-user	685/2175
SQL NT Workstation 6.5	475
System MGMT Server	629
Visual Basic Enterprise 5.0	1095
Visual Basic Prof. 4.0 for Win - CD	445
Visual Basic Standard 5.0 - CD	89
Visual Basic 5.0 Step by Step	24
Visual C++ Standard 4.0 - CD	89
Visual C++ 5.0 Professional	455
Visual Fox Pro Standard 3.0 for Win	189
Visual Fox Pro Prof. 5.0 / upgrade	449/235
Visual J++ (JAVA)	87
Visual Source Safe 5.0	475
Windows '95	*(179)
- oem version FD / CD	99/85
Windows '95 Plus - FD / CD	44/44
Windows '95 Resource Kit	29.95
Windows NT 4.0 Server Resource Kit	109
Windows NT 4.0 Workstation Resource Kit	59
Windows NT Server 4.0 w. 5-user	*(725)
Windows NT Server 4.0 w. 10-user	*(995)
- Win NT License: Single Client / 20 Client	35/599
Windows NT 4.0 Technical Training	*(99)
Windows NT Workstation 4.0 - CD	285
Windows for Workgroups	135
Word & Publisher Value Pak	125
Word 6.0 for Win	289
Word 97 / upgrade	299/78
Works 3.0 for Win - FD	49
Works + Bookshelf Win'95 - CD	69
Works 4.0 for Win'95 oem	39

QUARTERDECK

Cleansweep 3.0 for Win '95	38
Hijaak Graphics 3.0 for Win	89
Hijaak Prof 4.0 for Win '95	*(89)
Internet Suite 2.0	37
MagnaRam 2.0 for Win 3.11 & Win'95	24
Procomm Plus 4.0 for Win'95 - CD	124
Qemm 8.0 for Win '95 / upgrade	63/36
Remote-It 95	35
Speedy Rom for Win'95	*(19)
Total Web	86
Web Author 2.5 for Win'95	45
Web Compass 2.0	46
Win Probe 95	46
Zip-It for Win'95	37

SYMANTEC

ACT! 2.0 for Win	*(169)
ACT! 3.0 for Win'95 & NT	175
C++ 7.2 for Win NT & Win'95	69
For Your Eyes Only	75
Internet Fastfind 1.0	44
Norton Anti-Virus '95 v.2	66
Norton Anti-Virus for Win, Dos, Win'95 - CD	67
Norton Anti-Virus for NT - CD	65
Norton Desktop 3.0 for Win oem / reg	*(45/99)
Norton Disklock 3.5 for Dos/ Win - CD	79
Norton Healthy PC	28
Norton Navigator '95 - FD / CD	89.95/89.95
Norton NT Tools	47
Norton PC Handyman	48
Norton Utilities '95 v.2	69.95
Norton Utilities v.2 for Win NT	89
Norton Utilities 8.0	109
PC Anywhere 5.0 Remote & Host for Dos	124
- v2.0 for Win	125
- v7.5 for Win'95 & NT	135
Visual Cafe v.1 for Win'95 & NT	169
Visual Cafe Pro	399
Visual JAVA: Cafe v1.5 for Win 32	69
WinFax Pro 7.5 for Win'95 - CD	95

SCREEN SAVERS

After Dark 4.0 for Win'95 & Mac	29.95
Disney 1.0	28.95
Joe's Apartment Desktop - CD	22
Launch Pad Kid-Safe for Win	29.95
Lion King	17.95
Microsoft Scenes	19.95 ea.
Mickey & Crew	*(9.95)
Opus & Bill 2.0	27.95
Pocahontas	17.95
Toy Story	17.95
Where's Waldo¿ for Win - CD	24.95

OTHERS

3D Eye : TriSpectives / Professional	279/459
AccTrack v1.5	44.99
CA Clipper 5.3 for Win / upgrade	*(149)/89
CAERE: Omni Page Direct OCR 2.0	65
CAERE: Omni Page Prof. 7.0 for Win'95	435
CAERE: Wordscan Plus 4.0 / upgrade	389/139
Cakewalk Professional for Win - FD+CD	165
Cakewalk Professional Audio Deluxe - CD	285
Canvas for Win	265
Carbon Copy 3.0 for Win, 2-user	119
Claris: File Maker Pro 3.0 for Win	175
Claris Works 4.0 for Win'95	49
Connectons Telemarketing for SBT	*(79)
Daytime Organizer for Win'95	58
Design CAD 2D 7.0 for Win	179
Direct Access 5.1 for Dos	65
Eudora Pro - Single / 5-user	58/215
Fax Works Pro 3.0	*(19.95)
First Aid 97 - CD oem / reg	29/34
Form Buster Plus - CD	49.95
Fractal Dabbler 2.0	46
Fractal Design Painter 4.0 for Win oem	*(259)
Fractal Sketcher for Win	49
FTP: On-Net 32 for Win'95 (PC/TCP)	299
FTP: On-Net 2.1 for Win (PC/TCP)	299
FTP: X On-Net for Win / Win'95	185/185
Helix: Hurricane for Win	48
Helix: Multimedia Cloaking	32
Helix: Netroom 3.0 1 / 4 / 10-user	59/119/255
Hot Fax Message Center for NT & Win	95
Hummingbird: Exceed 5 for Win & Win 32	369
Hummingbird: Exceed Express / Host	225/119
Hummingbird: NFS Maestro TCP/IP	299
Hyper Access for OS/2	99
Hyper Access for Win'95	49
Internet Phone 4.0	*(28.95)
Internet Voicemail	29.95
Kai's Power Tools 3.0 for Win'95 & NT	119
Laplink 6.0 for Win / upgrade	129/85
Laplink for Win'95	129
Macromedia Action 3.0 for Win	149
Macromedia Director 5.0 for Win	835
Macromedia Fontographer 4.1 for Win - CD	319
Macromedia Freehand 5.0 for Win	375
McAfee: Virus Scan for Win & Win'95	45
McAfee: Virus Scan Deluxe for Dos/ Win/ Win'95/ NT	66
McAfee: Web Scan	46
Netscape Navigator 3.0 Gold for Win / Win 32	65/65
Novell Products Helpdesk - CD	29.95
Open Post 4.0	24
Partition Magic 3.0 for Dos, Win, Win'95, NT, OS/2	59
Passport Encore 3.0 (music)	365
PC-cillin 95 (anti-virus)	*(19)
Peach Tree Accounting 3.5 for Win - FD+CD	115
Peach Tree Accounting 9.0 Complete for Dos	185
QA Plus v7.1 for Win	59
Qualitas 386 Max 7.0	*(59)
Quark X Press 3.32 for Win	599
Stac: CD Quickshare Network Unlimited User	925
Stac: Reachout 7.0 Host & Remote	125
Stac: Replica 3 Intra Network Backup	750
Stacker 4.1 for Win'95	55
System Commander 3.0 (multi OS on PC)	69
Total Equal (turn PC into a comm center)	145
Turbo CAD 3.0 for Win	79
Uninstaller 3.0 for Win 3.11 & Win'95	34
Uninstaller 4.0 for Win NT & Win'95	35
Virus Net (for all OS including 32 bit)	45
Virus Trap Adapter (identify & prevent virus)	65
Virus Trap Adpater + Virus Scan s/w	95
Visio 4.0 for Win'95 & Win (business diagram)	135
Visio Technical 4.5	265
Visual: Instant 3D	48
Visual: Simply 3D	39
Watcom C++ 16/32 bit v.11 for Win'95	245
WebSite Director / WebSite Maker	95/49

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Alian Tale	36
Arthur's Birthday	*(19.95)
Arthur's Reading Race (age 3-7)	32
Berenbstain Bears: Gets in a Fight	*(22)
Berenstain Bears in the Dark	*(24)
Click-Art 40,000 Starter Image Pak	24
Click-Art 65,000 Classic Image Pak	41
Darby the Dragon (age 5-8)	29
Dr. Seuss ABC	*(22)
Family Tree Maker Basic Edition	25
Gone Fishing (Amtex)	39
Green Eggs & Ham (by Dr. Suess, age 3-7)	*(24)
Handwritten Font	36
Journey to the Edge	39
Just Grandma and Me MPC & MAC	*(24)
Last Express	49
Live Pix	48.95
Math Workshop oem / reg	*(17/34)
MYST MPC / MAC	34/48
Orly's Draw-a-Picture	34.99
PC Globe Map	*(12)
Playroom MPC - CD / FD	34/*(19)
Prince of Persia 1+2	22
Printshop Deluxe III	35
Printshop Press Writer	41
Ruff's Bone MPC / MAC	*(24.95)
Sheila Rae, the Brave	*(29)
Stellaluna (age 3-7)	32.95
Story of Creation (age 3-7)	26
Sunset Western Garden.	44
The Amazing Writing Machine	*(24)
The Little Monsters At School MPC / MAC	*(24)
The New Kid On The Block MPC & MAC	*(24.95)
The Tortoise and the Hare MPC & MAC	*(24)
Where in USA is Carmen SanDiego	39
Where in the World is Carmen SanDiego	39.95
William-Sonamo Good Cooking	39.95
Write, Camera & Action (age 8-12)	37.95

Microsoft (home series)

3D Movie Maker	*(29)
Ancient Land	29
Art Gallery Multimedia MPC	*(45)
Auto Map Street Plus 5.0	45
Bookshelf for Win '95 oem / reg	24/46
Cinemania 97 for Win'95	29
Close Combat	41
Complete Baseball MPC	29
Complete Basketball	*(25)
Creative Writer (age 8-14) oem / reg	14/29
Dangerous Creatures oem / reg	15/45
Dinosaur MPC oem / reg	25/29
Dogs	29
Encarta '97 oem / reg	36/46
Explorapedia: World of Nature oem / reg	19/29
Explorapedia: World of People	29
Fine Artist (age 8-14)	29
Flight Simulator 6 for Win'95	49.95
Fury 3	38
Golf 3.0 oem	*(19)
Greetings Workshop oem	22
Hellbender	40.95
Julia Child : Home Cooking oem / reg	19/29
Leopard Spots oem / reg.	22/29
Magic School Bus: Human Body	*(35)
Magic School Bus: Ocean	37
Magic School House: Solar Systems oem / reg	*(16/35)
Monster Track Madness	37
Multimedia Beethoven 9th Symphony	29
Multimedia Mozart MPC oem	22
Music Central 96 oem / reg	22/37
Musical Instruments MPC oem / reg	23/29
NBA Full Court Press	37
Oceans	*(24)
Space Simulator	*(39.95)
Strauss	29
Wine Guide oem / reg.	19/29
World of Flight oem	19.95

WALNUT CREEK

4.4 BSD Lite	17
2000 Truetype Fonts	24
Ada CD Rom (Aug '96) / (Mar '97)	19/21
Awesome Animation	16
ASME: Mechanical Engineering Toolkit	26
Avalon 3D Object	22
Blackhawk (for Win'95, Jan '96)	17
BSD Docs. May '96 / Sept '96	19/22
Business Software Library	23
Butterfly (shareware for Win)	12
C/C++ User Group Library (Jan '97)	26
CICA MS Windows (Aug '96)	13
CICA for NT (Dec'96)	22
CICA Shareware for Win'95, 3.1 & NT (Feb '97)	14
Clipart Cornucopeia	17
Clipart Image Library	23
CP/M	23
Delphi Programming	22
Delphi Toolkit (Dec'96)	22
East Asian Text Processing	23
Free BSD 2.15.	21
G N U for Unix & Sun (Feb '96)	23
GIF Galore	17
Giga Games vol.2 / vol.3 / vol.4	16/16/16
Hobbes OS/2 (Nov '96)	15
Home Education Learning Library	22
Inter Net Info (Oct '96)	17
Japan.JPG	22
Japanese Text Processing	23
Jolt Games (JAVA script)	19
Kirk's Comm	22
La Collection (English & Spanish)	18
Libris Brittania	25
Linux Toolkit 6CD (Mar '97)	21
Linux Slackware 4.0 4CD	18
Math Solutions	22
Music Workshop / II	22/22
Netlib	23
NEWT (NT s/w from Internet)	22
Official POV-Ray	23
PERL (Apr '96)	22
Power Dos	13
Project Gutterburg (Mar '97)	18
QRZ: Ham Radio vol.6 (Jun '96)	14
Ready to Run Hobbes OS/2	18
Scientific & Technology Library	23
Simtel MS Dos 2CD (Sept '96)	16
Simtel Windows	17
Source Code Internet Usenet	19
Sprite for Sun	14
Supreme Court	22
Task Buster.	22
Teacher 2000 (education programs)	18
Telecom	23
Tex (utilities, 2CD)	23
Travel Adventure	18
Turbo User Group (TUG, July '96)	24
Unix - System V v4.2	29
Visions : II Nature / III Object & Background	22 each
Visual Programming (Viper tools)	23
VR-Zone	15
Web Master Toolkit	22
X11R6 for Unix	23

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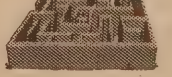
OTHERS

101 Dalmation Animated Storybook	39.95
Aladdin Activity Center (age 5+)	*(24.99)
Alphabet Blocks (age 3-5) oem / reg	14/*(29)
Barbie Fashion Designer (age 6+)	39
Barbie Magic Fairy Tales	30.95
Batman & Robin Moviebook (age 5+)	29.95
Big Job (age 4-8)	16
Book Workshop (age 8+)	26
Bug Explorers (age 4+)	24.95
Color, Shapes & Sizes (age 3-6)	*(19.99)
Cold Shadow (Disney)	36.95
Corel: Turnaround Turtle (age 3-7)	24
Corel: Bungalo Boys Big Fish Wish (age 4-10)	24
Crayons (coloring book, age 4-10)	14
Discovery Geography (age 9+)	14.95
Discovery Science (age 9+)	14.95
Disney: Follow the Reader & Sound Source	*(17)
Disney: Mickey's World Adventures (age 5+)	*(13)
Encyclopedia of Human Body (age 7+)	13
Encyclopedia of Inventions (age 7+)	13
Fin Fin Fun Pack (age 4-12)	21
Fisher Price: ABC (age 3-7)	32
Fisher Price: Great Adventures Castle (age 4-8)	19
Fisher Price: Sing-Along (age 3-7)	32
Fisher Price: Toyland (age 3-6)	23
Flipper (age 4-9)	33
Freddi Fish: Maze Madness	16
Freddi Fish: Water Worries	16
Frog Prince (age 4-7)	28
Grammar Games (age 9+)	32
Grammar Rock (age 6-10)	36
Greatest Children's Stories Ever Told	*(9.95)
Heinimann's Children Encyclopedia	*(9.50)
Hunchback of Notre Dame Animated Storybook	39.95
Hunchback of Notre Dame: Topsy Tury	39.95
Lion King Activity Centre (age 3-9)	*(29.95)
Lion King Animated Storybook	*(29.99)
Math Ace Jr. (age 4-8)	16
Middle School Mathematics (6th-8th grade)	38
Mr. Drumstick Music (age 3+)	16
Mr. Potato Head (age 3-7)	39
Muppet: Beginning to Read (age 3-7)	26
My Favorite Monster (age 4-10)	*(18)
My First Amazing Words & Pictures Dictionary	28
My Paint (age 2-12)	18
Nigel's Adventure in World Geography (age 7-13)	15
Ozzie's Travel (destination Japan, age 3-8)	13
Pajama Sam (age 3-8)	35
Paws in Typing Town (age 8+)	26.95
Pinocchio Activity Center	22
Plants & Animals (age 8-14)	12
Pocahontas Animated Storybook WIN	*(29.95)
Power Ranger : Coloring Book (age 4+)	24
Putt Putt: Balloon O' Rama (age 3-8)	16
Putt Putt: Dog on a Stick (age 3-8)	16
Reading Blaster Jr. (age 4-7)	28
Reading Blaster 2000 (age 6-9)	29
School Days (age 4-7)	16
Sesame Street: Elmo's Preschool Deluxe (age 3-5)	36
Seasame Street Get Set for Kindergarten Deluxe	36
Seasame Street Toddlers Deluxe (age 2-4)	36
Sierra ADI's : English (2-3 grd) / Eng. (4-5 grd)	29.95 ea.
Sierra ADI's : Math (2-3 grd) / Math (4-5 grd)	29.95 ea.
Sierra ADI's : Science (2-3 grd) / (4-5 grade)	29.95 ea.
Sleeping Cub's Test of Courage (age 3-9)	19.95
Spell It 3 (age 6+)	*(17)
The Children's Encyclopedia of Math (age 9-15)	24
Thinking Games Around the World (age 4-12)	9.95
Timon & Pumbaa's Jungle Games WIN	*(29.95)
Tonka Construction (age 4+)	25
Toy Story Activity Centre (age 5+)	39.95
Toy Story Animated Storybook	39.95
Toy Story Power Play (age 6+)	36.95
Trivia Muncher (science, age 8-14)	19.95
Type to Learn (3rd - 8th grade)	26
Undersea Adventure (age 5-10)	23
Winnie the Pooh Animated Story (age 3-8)	*(29.95)
World of Numbers (age 4-9)	*(16)
Zoo Opolis! (age 3-8)	12.95

GAMES (age 16+)



Aces Collection Series	41
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Astrorock	24.95
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Banzaibug	39.99
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Discworld II	45
Dr. Brain (the Time Wrap of)	35
Dr. Drago's Mad Cup Chase	15
Dragon's Lair II : Time Wrap	*(27)
Duke Nukem 3D	29
Enemy Nations	39
FA18 Hornet for Win'95	43
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History of the World	43
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Knights Chase.	39.99
Krazy Ivan	34
Krush Kill n' Destroy	40.95
Leisure Larry Suit 97 oem / reg	25/*(42)
Lighthouse oem / reg.	19.95/45
Lightning II	*(39)
Lords of Realm II oem / reg	22/*(40.95)
Magic the Gathering: Card Game	39
Master of Orion II (Battle at Antares)	49.95
MAX Mechanized Assault	49.99
MDK	39.95
MIA2 Abrams	41.95
Monopoly	34.95
Nascar Racing 2 oem / reg	21/*(38.95)
Necrodome	36
Nemesis	*(39.95)
Over 1000 Bundle (games +p rograms) 4CD	22
Pandemonium!	38
Pinball Gold Pack	18
Pinball World	31
Plague	17
POD	45
Power Chess oem / reg	18.99/39.95
Privateer II	52
Quake	39
Rama oem / reg	12.95/49.95
Rayman	14
Realms of Arkania: Shadows Over River	42
Red Neck Rampage	48
Risk	42.95
Roberta Williams Anthology	39.95
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Rumpelstiltskin's	23
Scarab	41
Scorched Planet	34
Scrabble	39.95
Screamer II	31.95
Screaming Skies	16
Sega Rally	36
Shadoah	39.50
Shanghai Greatest Moment Double Pack	33
Shellshock	42
Shivers II	51
Sim Classics Collection #3	36
Smart Patrol	35.95
Soldier Boyz	33
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Star Command Revolution	42.95
Star Gunner	22
Star Trek: Voyager	29.95
Stars	39.95
Stay Tuned!	38
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Theme Hospital	45.95
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Tiger Shark	42.95
Time Comando	41
Titanic Adventure	*(36.95)
Ultimate James Bond (w. free video)	39.95
Ultimate Pinball	14.95
Ultra Wolfenstein 3D (all levels)	24
Virtual Pro Pinball	39
Virtual Safari	27
Williams Arcade Classics Dos & Wn'95	16
Wolfenstein 3D	14
X-Wing vs Tie Fighter	39.95
You Don't Know Jack: Movies	34
Zapitalism! Deluxe	34

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ART

3D Fonts	13
Calendar Creator 4.0	18.95
ClipPix 500 (2CD)	**(9.50)*
Decotech Designer 5 (3D interior design)	19.95
Designer Pak	19
Do-It-Yourself Collection (3 titles)	39.95
Escher Interactive	34.95
Expert : Clipart 3D	15
Expert : Kids Fonts	15
Eyewitness Photo Gallery : Children (DK)	11
Eyewitness Photo Gallery : Wild Animals (DK)	11
Gift Maker WIN	16
Instant Greeting Card	16
Key CAD Pro oem / reg	17/33
Label-It-Right Collection (3 titles)	42
Let's Draw	35
Painters Painting	26
Photo Finish 4.0	14
Print Master Gold Publishing Suite 3.0	37
Raphael: An Artist for the Vatican	28
Serif Page Plus	19
Sistine Chapel (Michelangelo's art)	32
Super Sketch for Win	11
Swift CAD	16
Turbo CAD 2D/3D	36
Water Color My Way (by Jack Reid)	19.95

ATLAS / MAP / TRAVEL

3D Atlas '97	34.95
3D USA Explorer	23
Best Beaches in the Caribbean	19
Cartopedia (by Dorling Kindersley)	**(31)*
Compton's Interactive World Atlas	39.95
Compton's World Atlas '97	14
Exploring America's National Parks	15
Frommer's Travel : Boston '96	27
Frommer's Travel : New York City '96	27
Map & Go / 2.0	*(25)/36
See the World by Train	29.95
Small Blue Planet: 3D Talking Globe	22.95
Street Atlas 4.0 for Win & Win 32	42
Travel CD Piranha Pack	32.95
Walt Disney World Explorer	38.95
World Atlas 5.01 MPC	9.95

BIBLE

Believe (Bible reference set, 5CD)	29.95
Bible Builder DOS	14
Bible Heaven	11
Bible Library (9 books + 20 references)	19
Bible Rom: Creation / Moses / Noah's Ark/ Joshua	14 each
Bible Study & Games II	13
Complete Bible WIN	15
Expert : Bible Explorer Win3.1 & Win'95	18
Holy Bible DOS	16
Illustrated Holy Bible	17
Interactive Children's Bible	16
Interactive Old Testment	14
King James Bible	11
Multimedia Family Bible WIN	12
New Family Bible PC, MAC	18
Play n' Learn Bible II	13
Proverbs Screen Saver WIN	11
Quick Verse 3.0 (King James version)	11

BUSINESS

808 Great Letters Win'95 oem / reg.	16/46
1001 Essentials Letters	28
Business Card Pro	14
Expert: Forms	14
Form Designer Pro	15
Japan Business Travel Guide	14
Multimedia Business 500 WIN	12
Office Collection (3 titles)	52
Personal Law Library	42
Small Business Advantage 6CD	39.95
Tab Works 2.5 (organizer)	33

COOKBOOK

Cocktail Classics	15
Compton's Complete Interactive Cookbook	13
Cooking for Today: 4-in-1 bundle	19.95
Easy Bartending	9.95
Easy Cooking : Thai / Greek / French / Italian	18 each
Healthy Cooking	**(6.99)*
Making Great Pastries (Art de la Table) oem / reg.	12/22
Master Cook: Cooking Light 4.0	33
Master Cook: Jenny Craig Cookook	36
Master Cook II	13
Rich & Famous Cookbook	9.95
Visual Chinese Cookbook (2CD) MPC	17
Wines of the World Gold Edition (w. book)	30
World Cuisine: Low Fat / Mexican	16 each
World Cuisine: Chinese / Vegetarian Dish	16 each

DICITIONARY / STUDY AIDS

Acing the New SAT	26
American Heritage Talking Dictionary '96	16
Biology Science Wizard	15
Calculas I / Calculas II (Pro-1)	14 each
CBEST (CA Basic Skill Test)	33
College Guide 97	12
English (Pro-1) 4CD set	36
GMAT	33
LSAT (Law School Admission Test)	33
Multimedia Talking Picture Dictionary	29
Multimedia Vocabulary for Win'95	14
Pro-1 series:	
- Biology / Fractions / Geometry / Physics	14 each
Physics Science Wizard 1 / 2	15 ea.
Super Tutor : Chemistry / Physics	23 each
Visual Dictionary (talking edition)	35.95
Young Student Reference Library	11

ENCYCLOPEDIA

Compton's Encyclopedia 97	15
Encyclopedia of Drugs	11
Encyclopedia of Knowledge	15
Encyclopedia of Nature (by Dorling Kindersley)	**(29)*
Encyclopedia of Science (DK)	**(30.95)*
Encyclopedia of Space & Universe (DK)	36
Encyclopedia of U.S. Stamps	18
Grolier Encyclopedia '97	18

HEALTH / MEDICAL

EZ-Relax Massage for Computer Users	17
Family Medical Guide (by Dorling Kindersley).	**(29.95)*
Mayo Clinic : Health Book MPC / MAC	15/19
Mayo Clinic : Sports & Health Fitness	12
Mayo Clinic : The Total Heart oem / reg.	12/25
Mayo Clinic : Ultimate Medical Guide	38
Medline Professional Update	28
Nine Months Miracle w. mouse pad WIN	35
The Herbalist	29.95
Ultimate 3D Skeleton (DK)	28

HISTORY

18th Century (meet the makers of history)	26
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History of Ships & Navies	35
History of the World (by DK) PC & MAC	19
History of US Space Program	17
History : W W II Global Conflict	46
Industrial Revolution	11
Jerusalem	25
Mythology	26
Nile: Passage to Egypt	34
Portraits in History (3CD)	46

HOME / FAMILY / GARDEN

3D Deck	46
3D Garden Designer	*(12)
3D Home & Office Design	12
3D Kitchen oem / reg	18/42
3D Landscape	48
3D Virtual Reality Room Planner	17
Babybook	13
Best Home Plans (by Sunset)	23
Better Home & Garden : Complete Guide to Gardening	13
Better Home & Garden:Planning Your Home	29.95
Complete Guide to Wedding	18.95
Complete House WIN	15
Country Living Style	29
Country Living Combo	44.95
Expert: Family Album	14
Expert: Home Design 3D Win3.1 & Win'95	14
Exotic Garden	18
Family Album Creator	44.95
Family Tree (by Softkey)	12
Fisher Price: Parenting Guide	31
Garden Encyclopedia	29
Gardening Multimedia Handbook WIN	13
Gazebo Gardens	36
Great Home Gardens (country living gardener)	29
Home Improvement WIN oem / reg	18/24
Home Repair Encyclopedia WIN	27
Home Safe¿ w. Martin Short (childproof guide)	12
Key : Home Designer (by Softkey) WIN	24
Key : Home Garderner WIN oem / reg.	9.95/16
Land Designer / 3D	*(18)/45
Living Trust Maker	44
My House (3D design) WIN	29
Simply (4 home productions)	15
Visio Home	**(9.95)*
Wedding Planner	15
Will Maker	39

INTERNET

All Star Applications (best of internet) Win'95	16
AsiaSurf	69
Atlantis Internet	17
Best JAVA Applets	18
Black Coffee (Java)	15
Building Your Own Internet Server w. NT	16
Collection of Internet	13
Complete Internet Collection (6CD)	32
Developers Tools for JAVA	21
E Base (email database)	15
Easy Personal Web Page	12
Expert Internet Tutorial	15
Expert:Web Site Clipart oem / reg	16/18
Great Web Art & Tools	22
HTML Cliparts	10.95
HTML Template Master WIN / MAC	23.95
Info Magic : InterNet Tools	16
Info Magic : JAVA	16
Info Magic: Web Master vol.1 / vol.2	18/18
Info Magic: World Wide Catalog	17
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Internet Connection WIN	16
Internet Edge PC & MAC	12
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Internet Publisher's Toolbox	13
Internet Watchdog	22
JAVA+	15.95
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JAVA Starter Kit for Win'95 & NT	43
NASA Archives: Aeronautics (internet)	29.95
NASA Archives Engineering Source Codes	29.95
NASA Archives: Flow & Structure (internet)	29.95
NASA Archives: Modeling (internet)	29.95
NASA Archives Power Packs 4CD (internet)	65
Oil Changer	34
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Ramp (internet guide)	11
Super Plug-in for Netscape	12
Talk Free (internet passport)	11
- Complete Set (w. headset)	24.95
Web Graphics	44.95
Web Max	34.95
Web Pages 1 for Education MPC	9.95
Web Pages 2 for Computer Software MPC	9.95
Web Surfing & Publishing Kit WIN.	**(39)*
Web Weaver Plus Win3.1 & Win'95	18
WIA: Windows Internet Archives WIN	15
World Wide Web Directory	26

LANGUAGE

Chinese :

Chinese Adventure - The Great Wall	21.95
Chinese Characters (English version)	28.99
Chinese Computer Tutor Series - Windows 3.1	19.95
Chinese Multimedia Dictionary (fascinator)	39.95
Chinese Partner 4.0 Win & Win'95	165
Chinese Partner Pen	139
Chinese Poems Tours w. Book	26.95
Chinese Proverbs in Stories	18.99
Illustrated English - Chinese Dictionary	46
Simple Chinese for Business & Travel	25.99
Understanding Chinese Language (dictionary)	65

Others :

Amiecan Sign Language 2.0	45
EZ French / Japanese / Italian / Span / Russian	14 each
French Vocabulary Builder	15
German Vocabulary Builder	15
Japan Multimedia Tour	16
Japanese Partner 4.0 for Win'95 - Standard	185
Language Learning: Fren/ Jap/ Ger/ Ital/ Span.	13 each
Learn to Speak German PC, MAC	89
Playing with Language MPC	17 each
Russian NOW! 4.0 (age 12+)	55
Think & Talk: Italian / French / Spanish	99 each
Who is Oscan Lake¿ - Eng / French / Span	44 each

LINUX

InfoMagic: Linux Developer's Resource 6CD	20.95
Info Magic : Linux Tool Box (Dec '96)	**(29.95)*
Linux Developers Kit 11CD (Nov'96)	**(29.99)*
Linux Internet Archives 97 (8CD, by Yggdrasil)	19
Linux Megapack 12 CD	39
Linux : Plug & Play by Yggdrasil	27
Red Hat Archives Linux 4CD	19.95
Red Hat Official 4.0 Linux (w. Metro X)	35.95
Red Hat Linux Annual Support	299
Red Hat Power Tools 4.1 Linux (6CD)	19.95

MUSIC / MOVIE / VIDEO / SOUND

Cakewalk Song Station	**(39)*
Forest Gump WIN & MAC	39.95
Garage Band	24
Instant Autoplay	19
Jazz Guitar WIN	34
Midisoft 3 Pak (music trio)	12
Midisoft MidiKit w. cable	29
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Piano Discovery System (keyboard + software)	195
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Richie Sambora Interactive Guitar	27.95
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Santana	29
Steven Spielberg Directors Chair	49.95
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The Crow	28
Virtual Graceland (Elvis)	35

SPORTS

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FIFA Soccer '97	**(38.95)*
Front Page Sports: Golf	51
Jack Nicklaus 4	49.95
Links Course Library vol.1 / vol.2 / vol.3	23 each
Links LS (Arnold Palmer & Legend in sports)	44.95
Links LS Championship Course Valhallal	22
Madden '97	39.95
NBA Live 97	38.95
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NFL Quarterback Club 97	44.95
NHL Hockey 97	38.95
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Slope Style	24
Sportsman Paradise (hunting)	25
Triple Play 97	49.95
Ultimate Sports Series	33

WILDLIFE / DENIZEN

Amphibians & Reptiles	11
Animal Planet (age 9 & up)	36
Birds: Cranes thru' Passerines	11
Birds: Ostriches thru' Guinea Fowl	11
Ecosystems	11
Insects	11
Mammals: Canids thru' Sheep	11
Mammals: Echidna thru' Whales	11
Urochordates & Craniata thru' Fish	11
Virtual Reality : Birds (Dorling Kindersley)	**(22)*

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Web Page Listings

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A Games Page *http://www.geocities.com/TimesSquare/8571/index.html* The current game is Diablo. Check for new games coming out. [Exp. #167.]

Astrology By Moonlight *http://www.masterm.com/astrol.html* Weekly astrology listings by sign. Multiple links. [Exp. #168.]

BayNar Model Rocket Club *http://members.aol.com/ddavis6747/rockets/baynar.htm* Model rocketry, NAR affiliated, family-oriented that's fun for all ages. Model rocket launches every Sunday. [Exp. #168.]

Best Deals In Las Vegas *http://www.geocities.com/WallStreet/8580* Free info on best deals on airfare, hotel, dining, show, plus gambling strategies! [Exp. #168.]

Club eXO *http://www.clubexo.com* New York City supper club and discoteque. [Exp. #168.]

The CD List Guy *http://home.earthlink.net/~searchme/thecdlist.index.html* Rare and not-so-rare music CDs, free email subscription, promos, etc. [Exp. #167.]

Contest Guide *http://www.ContestGuide.com/* A guide to contests, sweepstakes, and giveaways on the Web. [Exp. #166.]

THe DeaD SouLs HoMe PaGe *http://www.geocities.com/Area51/8426/htdf.html* NIN, Metallica, Soundgarden, Jewel, 311, No Doubt, Garbage, Silverchair, Bush, and more. [Exp. #168.]

Dee Zaster. Esq. *http://www.globalpac.com/umpsm/c5.htm* The DZ gal is bound for Europe—and the continent will never be the same. [Exp. #167.]

DMTHG Productions *http://www.dmthg.com* Home of the Midi Music Machine, Bishop Gallery, Lion Pub, and swinner's photo album. [Exp. #168.]

Eagle Golf Handicap Service *http://www.eaglehandicap.com/* [Exp. #168.]

Ebonipearle Productions *http://www.ebonipearle.com* Get Nescape 3.0 or higher and-surf Los Angeles with .wav-s. Something for everyone. [Exp. #166.]

Estes Vineyards *http://home.earthlink.net/~damin* Learn to make homemade wine and how growers grow wine grapes. [Exp. #166.]

Florence Multimedia *http://www.florencemm.com* Florence restaurant, hotel, art, and culture on the Net. [Exp. #168.]

The Funk—Live Music Video *http://www.thefunk.com* Music video from live concerts. [Exp. #168.]

Genghis Angus *http://www.genghisangus* One of the best unheard bands in the new breed of grass roots groups like Hootie and Dave Matthews. [Exp. #168.]

GT Weather *http://netcentermall.com/gtweather* Weather reports for recreationists—forecasts, satellite images, live ground crews, and highway conditions. [Exp. #167.]

H. o. B. Film Production Web Site *http://ourworld.compuserve.com/homepages/boakye* British film investment opportunity. We're taking over the Oscars. If you can't beat them join them! [Exp. #168.]

Hotel Carasco *http://space.tin.it/turismo/mdelbono/index* [Exp. #168.]

Humor *http://www.masters.com/humor.html* Laff—it's good for your insides. [Exp. #168.]

InsideWLA *http://www.insidewla.com* Community site featuring restaurants, nightclubs, and shopping. Regularly updated articles, photos, and entertainment section. [Exp. #166.]

Island Quest *http://divequest.com* Beginner through technical scuba dive training, travel, and adventure. [Exp. #168.]

The Karaoke Zone *http://pw2.netcom.com/!lilalynn/KARAOKEZONE.html* Providing Karaoke and/or DJ mobile entertainment plus additional entertainment options for any event. [Exp. #168.]

Mental Relapse—Back In The 1960s *http://hyperion.advanced.org/ 11044* An interactive educational 1960s history site. [Exp. #168.]

Motorcycle Racing With Shawn Higbee *http://www.higbee-racing.com* Professional motorcycle racing information featuring top AMA factory Ducatti Superbike star Shawn Higbee. Racing photos and stories. [Exp. #167.]

The Nunavut Handbook *http://www.arctic-travel.com* A travel guidebook that aims to become the most comprehensive guide to the Canadian Arctic is now online. [Exp. #167.]

OnVideo *http://www.cyberpod.com/cyberpod/onvideo.htm* A complete home video guide to current and forthcoming movies released on tape. [Exp. #167.]

Pho Nam *http://www.pipeline.com/~phiet/phonam.html* The best PHO Vietnamese restaurant. Three locations—come and check it out. [Exp. #167.]

Project EBE *http://www.project-ebe.com* Online source for sci-fi happenings and accessories. [Exp. #168.]

Rock And Roll Hall Of Fame And Museum *http://www.rockhall.com* [Exp. #166.]

Samplemania: Samples On-Line *http://www.samplemania.org* Samples of many instruments and styles all in AIFF and WAV formats for you to use. There will be the possibility to purchase music for you site too. [Exp. #168.]

Starbucks Morning Coffee Club *http://home.earthlink.net/~bacdoc/coffee.htm* Caffeine-powered humor with tounge firmly in cheek. [Exp. #168.]

Strychnine Blotter Party *http://home.earthlink.net/~kittyfeet/strict9.htm* Just your typical psychedelic, death-rock group from Frisko. Music for the bummer of love. [Exp. #167.]

Thrills Unlimited *http://www.ThrillsUnlimited.com* The dangerous world of motorcycle daredevil Ken Mackow. [Exp. #168.]

Total Gaming *http://members.aol.com/gamefrk999* Over 2000 cheats for the PSX, PC, N64, and Saturn. Over 500 downloads and more. [Exp. #166.]

Tramline Tours *http://www.tramline.com* Tramline offers free automated online tours on any topic where there are Web resources, including a complete introduction to Internet skills and technology. [Exp. #168.]

Transporter 2 *http://www.seas.ucla.edu/~poirier/transporter2/bookmark.htm* Star Trek LCARS-based listing of 1000+ useful sites on the Net. [Exp. #167.]

Tropicana International *http://www.cubaweb.cu/tropicana/index.html* Promoting Cuban music and culture. [Exp. #168.]

Video Game And Anime Sound Site *http://www.geocities.com/RainForest/4961/index.html* Get video game and anime sound clips, midis and pictures. Ranma, Ronin Warriors, Dracula X. [Exp. #168.]

Virtual Conventions *http://www.hostcity.com/virtual* Human vs. human network multiplayer gaming. Stop playing against the computer. Shoot your buddy instead! [Exp. #168.]

The Weather Channel *http://www.weather.com* Redesigned to help consumers navigate through the comprehensive weather information and lifestyle content available on the site. [Exp. #167.]

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nal quality at the remote location. This is where we spent most of our time during the next two and a half weeks. Each site had to be surveyed; then we had to work with the local people in charge of that site to convey to them what needed to be done and make sure that the proper permissions were obtained to do the work.

At some sites, nothing major was required, as the antenna and the radio/router ended up being in the same room. In other sites, such as the US Embassy, the antenna had to be mounted on the roof and feedline run several floors to get to the radio and the router. Once the site preparation was complete, it was a very simple matter to install the radio and router.

One major problem developed, once we were over the site preparation issues and got to testing the radios. We found the PCs we selected were unable to have their serial ports run at speeds over 19.2Kbps without data overruns; as soon as we tried to send data to the radios at any speed over 19.2Kbps, nothing worked. After a few days spent in investigating the cause of the problem, we discovered that even though the technical specifications of the PCs indicated that the on-board serial hardware could be run at speeds up to 115.2Kbps, this was not the case. DataCom has some new Pentium PCs that arrived while we were there, intended for a public Internet access center. When we installed Linux on those machines, configured it as a router, and set the serial interface to the 115.2Kbps speed, everything functioned properly.

As luck would have it, we were able to contact someone coming over from the US to Mongolia. This person brought the necessary number of high-speed serial cards over; we were able to install them in the PCs that we had and get them to function properly at the higher datarate. As a result, we were finally able to leave Mongolia, after a slightly longer stay than we'd planned, with the wireless network installed and good connections to the seven remote sites.

The network that we installed is still up and running today. The staff at DataCom has been able to maintain the network and even extend it with additional sites.

Lessons Learned

Here is a summary of some of the key things we learned as a result of this effort:

- A good site survey ahead of installation is the key to the installation's success. The specifics of a survey require people with a good deal of expertise in several areas. If you can't get those people to the site ahead of time to perform the survey, success can be in serious doubt in such remote locations as Mongolia.
- Always make sure that you test the equipment that you're using before you ship it to a remote location. Never believe the specifications for a product until you've tested it yourself!!!
- Radio is still something like a black art (i.e., magic). There is always something new to be learned. Until we had gone to Mongolia and did this installation, we would have never believed that you could deploy such a wireless network in a dense urban area without having line-of-sight to all locations.
- Low-cost spread-spectrum radio products that are being used in increasing numbers in the US to deliver access to the Internet can be successfully deployed in developing countries with limited expertise in both radio and Internet technologies.

In closing, we'd like to take this opportunity to acknowledge the help and assistance of Steve Goldstein of the NSF, without whose caring and wisdom this effort would not have been possible. ■

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BMUG

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What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its 15,000 international members. BMUG supports many special interest groups (SIGs), 18-line Planet BMUG and 11-line BMUG Boston BBSes, a software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 500-page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:30–9:30 (or whenever we finish), on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose. Check the Announcement Line at (510)549-2684, ext. 8.

The BMUG Office, 2055 Center St. (a half block from the BART station), is open to the public 8:30 am–4:30 pm. Please come by, say hello, and meet other members.

The BMUG Helpline provides volunteer technical assistance and telephonic hand-holding for our members. If your question can't be answered on the spot, we try to get you in touch with someone who can help. Improve your Macintosh education and help others by becoming a Helpline volunteer!

BMUG has one of the most up-to-date, comprehensive software libraries around with hundreds of disks filled with the latest versions of public domain or shareware programs. BMUG also produces CD-ROM collections, including the digital video *TV-ROM™Too*, and the *BMUG PD-ROM.*

Planet BMUG and BMUG Boston are graphical user interface FirstClass bulletin board systems, offering the latest in shareware, as well as news, private email, rumors, etc. With our 18-line capability, you can have access to BMUG almost 24 hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most online services. BMUG can also be reached through the Internet network at *UG0001@applelink. apple.com* .

To get some further information about BMUG please write to: BMUG, 1442A Walnut St., #62, Berkeley, CA 94709. If you prefer to phone our business office, call (510)549-BMUG, or fax (510)849-9026.

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MMX-P166/512K (Asus TX97)	1458
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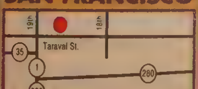

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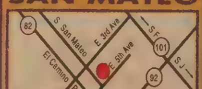

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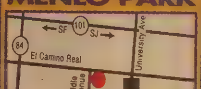

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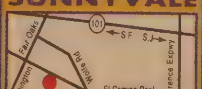

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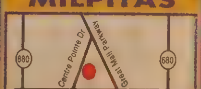

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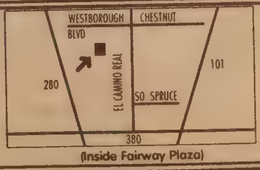

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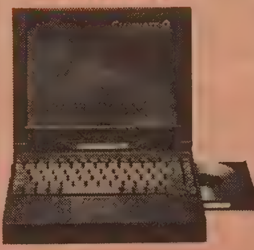

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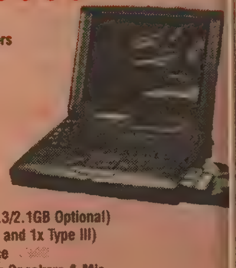

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- 180W Stereo Speakers
- Win 95 Full OEM CD Version

Pentium® 120MHz	$1055
Pentium® 133MHz	$1075
Pentium® 150MHz	$1095
Pentium® 166MHz	$1155
Pentium® 200MHz	$1205
166 MMX/200MHz	$1225/1455

Call for Latest CPU Prices!

MOTHERBOARDS W/O CPU

ASUS P55T2P4 Triton II PCI w/256K PLB	$145
QDI P5I430VX-T2 Triton II PCI w/512K PLB	$100
Intel Venus Pentium® Pro	$180
486SX-DX4 PCI/ISA/VLI3/EIDE/Fast I/O	$60
FIC VA501 Pentium® PCI w/256K M/B	$75

FLOPPY DRIVES

Teac 1.44MB 3.5" Floppy Drive	$25
Teac 1.2MB 5.25" Floppy Drive	$45

DISPLAY CARDS

Trident 9680 64-Bit PCI 1/2MB VRAM	$32
Diamond Monster 3D 4MB EDO DRAM (retail)	$189
Diamond Stealth Video 1MB EDO	$55
Diamond Stealth 64 PCI 2MB	$105
Matrox Mystique 2MB SGRAM	$105
Matrox Millennium 4MB WRAM (OEM)	$180

CD-ROM DRIVES

Mitsumi 8X	$85
Mitsumi 12X	$95
Toshiba 12X	$95
Mitsumi 16X	$105

SOUND CARDS

Sound Blaster 16 PnP w/o EIDE	$45
Sound Blaster 32 PnP (OEM)	$85
Sound Blaster AWE 64 PnP	$165
ESS ST-1868 16-Bit Sound Card	$25

MONITORS

Sampo KM-400 14" .28mm	$170
Sampo KM-511 15" .28mm	$230
Impression 14" SVGA 28 NI	$175
Impression 15" .28 NI	$260
Impression 7 Plus 17" .27mm Monitor	$465
MAG DX700T 17" 25	$675
MAG DX15T 15" .25	$370
Viewsonic 17PS 17" SVGA .25	$695
GVC 15" Digital 1280x1024 .28	$195

HARD DISK DRIVES

EIDE DRIVES

Western Digital 1.6GB	$185
Western Digital 2.1GB	$205
Western Digital 2.5GB	$225
Western Digital 3 1GB	$255
Western Digital 4 0GB	$325

ENHANCED IDE CONTROLLERS

DTC 2280E ISA IDE 2HD/2FD/16550	$25
Promise EIDE/ISA w/o BIOS	$28

SCSI CONTROLLERS

Adaptec 2940 UW	$225
Adaptec 1522 SCSI ISA	$75
Adaptec 2940 PCI Fast SCSI/Kit (OEM)	$175
ASUS SCSI II SC200 Controller	$69

FAX/MODEMS

US Robotics X2 56K Int. (OEM)	$160
US Robotics X2 56K Ext. (retail)	$205
Smartlink 33.6 Int	$55
Smartlink 33.6 Int w/Voice	$65
US Robotics Sportster 33.6 Int (OEM)	$95
US Robotics Sportster 33.6 w/Voice Int (OEM)	$110

NETWORK CARDS

3Com 3C589 PCMCIA RJ45	$130
3Com 3C589c PCMCIA Combo	$165
3Com 3C590 PCI Combo	$120
NE 2000 Network Combo/ISA	$22
Intel EtherExpress 10/100	$62

LAPTOP FAX/MODEMS

33 6 v 34 PCMCIA	$125
Novalink 28.8 w/Cellular Voice	$199
Novalink 28 8 w/Cellular LAN Combo	$330
Megahertz 28 8 PCMCIA/Cellular	$235
Fujitsu PCMCIA 28.8 v.34	$190

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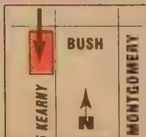
• We Also Do Laptop Upgrades • 1-Year Part & 3-Year Labor Warranty on All Computers



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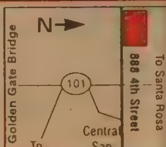


Product Spotlight

Updates

ACI US, Inc. has shipped **4D Desktop**. $499. ACI US, Inc., 20883 Stevens Creek Blvd., Cupertino, CA 95014. 1-800-881-3466, or URL: *http://www.acius.com* .

Applied Arts Ltd. has released **Easy Wedding Organizer 2.5**. $38. Applied Arts Ltd., P.O. Box 54, Needham, MA 02192. (617)455-1472, or URL: *http://www.ezwed.com* .

Deltec Electronics Corp. has unveiled a new line of **PowerRite Pro II Series Uninterruptible Power Systems (UPS)**. $699. Deltec Electronics Corp., 2727 Kurtz St., San Diego, CA 92110. 1-800-854-2658, *info@deltecpower.com* , or URL: *http://www.deltecpower.com* .

Deneba Software has announced that it will ship a free **Canvas 5.0.2** to 150,000 registered Canvas 5 users. Deneba Sofware, 7400 SW 87th Ave., Miami, FL 33173. (305)596-5644, *postmaster@deneba.com* , or URL: *http://www.deneba.com* .

Digimarc Corp. has announced **PictureMarc 1.5**. DigiMarc Corp., 521 SW 11th Ave., Ste. 200, Portland, OR 97205. 1-800-DIGI-MARC, *info@digimarc.com* , or URL: *http://www.digimarc.com* .

Fractal Design Corp. has shipped **Fractal Design Painter 5** for Macintosh. MSRP: $449; $99 for upgrade for licensed users. Fractal Design Corp., 5550 Scotts Valley Dr., P.O. Box 66959, Scotts Valley, CA 95067-6959. 1-800-846-0111, or URL: *http://www.fractal.com* .

LEVEL\5 has made available **Quest v2.5 Beta** (via free download at Web site). LEVEL\5 Research, 1335 Gateway Dr., Ste. 2005, Melbourne, FL 32901. 1-800-444-4303, or URL: *http://www.L5R.com* .

Lincoln Beach Software has released **Web-It! v2.0**. $99. Lincoln Beach Software, P.O. Box 1554, Ballwin, MO 63022. (314)861-1500, *lnclnbcht@lincolnbeach.com* , or URL: *http://www.lincolnbeach.com* .

Portland Software has made available **ZipLock 2.0**. Portland Software, 1000 Broadway, Ste. 1850, Portland, OR 97205. 1-800-ESD-MADE, *info@portsoft.com* , or URL: *http://www.portsoft.com* .

Rational Software Corp. has unveiled **RequisitePro 2.5**. $195. Rational Software Corp., Ste. 106, Boulder, CO 80301. (303)444-3464, *information@requirement.com* , or URL: *http://www.rational.com* .

WinWhatWhere Corp. has shipped **Release 97.1 of WinWhatWhere 97**. $99; $25 upgrade for registered users. WinWhatWhere Corp., 925 W. Kennewick Ave., Kennewick, WA 99336. (509)585-9293, *w3@winwhatwhere.com* , or URL: *http://www.winwhatwhere.com* .

Wolfram Research, Inc. has announced **Mathematica for Students 3.0.** $139.95. Wolfram Research, Inc., 100 Trade Center Dr., Champaign, IL 61820-7237. 1-800-441-6284, *info@wolfram.com* , or URL: *http://www.wolfram.com* .

Product Reviews

PC Software Reviews

EasyCustomInvoices

Published By: MySoftware Company
List Price: $79.95
Review By: David A. Simon, CPA

This is an easy-to-use, inexpensive invoicing system. It can be configured quickly with a set-up wizard, enabling even the uninitiated to produce invoices quickly. The program requires Windows 95.

EasyCustomInvoices fills a special niche for simple billing software in a market dominated by far more complex and expensive packages. Many sole practitioners or tiny business operators who bill infrequently simply use their word processor to create invoices—an awkward approach that fails to track billings and receivables and automatically relate them to one another. The package is ideal for anyone who generate relatively few invoices or has simple billing needs, but wishes to keep track of any A/R they do generate and who wants to send bills that look sharp.

The program performs the basic accounts receivable functions—it tracks time and expenses, generates bills, and lets you log payments.

EasyCustomInvoices presents a handful of reasonable formats and selection criteria, cuts to the chase, and avoids most of the hassles of setting up and running full-bore accounts receivable software. In handling the billing process swiftly it foregoes the additional steps—and features—of other systems used by even small businesses.

For example, don't look here to select fee options or to keep track of multiple client matters under a single account. A solo attorney with many clients, for example, probably would find this package underpowered.

Notwithstanding its entry-level territory, several features are noteworthy. For product and service descriptions, you have your choice of tabular or paragraph format, allowing billers to enter unique narrative descriptions of services provided. The CD-ROM contains a thousand clip art pieces providing logo options for the invoice heading. Existing client lists can be imported from other programs using standard database formats.

EasyCustomInvoices is a great solution for the consultant, independent contractor, or a small service operation that recognizes the importance of good record keeping and a professional appearance. (MySoftware Company, 1259 El Camino Real, Ste. 167, Menlo Park, CA 94025-4227. 1-800-325-3508. URL: *http://www.mysoftware.com*)

Product Announcements *continued...*

HyperACCESS for Windows 95 and NT

Published By: Hilgraeve
List Price: $129
Review By: Matthew Leeds

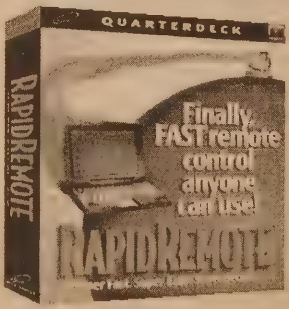
Windows users have long been accustomed to getting a free terminal emulator as part of Windows. The HyperTerminal program included with Windows is written by Hilgraeve, which offers both a free upgrade and this commercial upgrade. The commercial version, HyperACCESS for Windows (HAW), fully takes advantage of 32-bit code for speed, long file name support, drag and drop, pop-up menus, docking toolbars, and help wizards. It also supports ActiveX scripting, OLE, VBScript, JavaScript, and DOM. There's a full API for other language compatibility as well.

HAW offers a massive list of emulated terminals, Telnet, and hot-linking to Web sites; just double-click on an URL then right-click and select Shortcut to, and your browser gets launched with the URL. You can drag phonebook listing to the desktop for quick access, and set up HAW as your default Telnet application. HAW includes support for Microsoft's new Intellimouse. It also checks downloaded files for viruses, including macro viruses, and it can decompress ZIP files on-the-fly.

I'm particularly fond of the massive scrollback buffer, the spell-checking, the text editing and chat windows, the Z-modem support, and the complete TAPI integration. The built-in graphics viewer (GIF, JPEG, TIF, PNG or other bitmaps) is useful as well. I've also found their technical support to be responsive. Check them out at *http://www.hilgraeve.com* . (Hilgraeve, Inc., 111 Conant Ave., Ste. A, Monroe, MI 48161. 1-800-826-2760)

RapidRemote For Windows

Published By: Quarterdeck
List Price: $69
Review By: Matthew Leeds



Network managers get tired of getting out of bed and driving back to work in the middle of the night to fix network problems. Smart network managers quickly learn the advantages of remote management of network assets. One element of such management is a remote control software package such as RapidRemote.

There are two ways to gain remote access to a network: remote node and remote control. Remote node uses a dial-in server (such as a Shiva LanRover) to duplicate the connectivity to the network for a remote computer, albeit at modem speed rather than Ethernet speed. This can work for some applications as long as you're not launching large applications across slow modem links. The other approach is remote control, where you remotely control a computer on your network, and receive screen updates only across that slow modem link.

RapidRemote takes advantage of Microsoft's Graphical Device Interface (GDI) to send function calls rather than bitmaps to update the remote screen. It supports TCP/IP or IPX/SPX network connections, serial connections, TAPI, and ISDN. It offers file transfers and directory synchronization, resolution and color scaling, remote printing, chat, and a host of security features that include password protection, logging, screen blanking, mouse and keyboard locking, and data encryption. The performance across a 28.8Kbps modem link is very acceptable.

The current version is Win95-only but by the time you read this a free update that also supports Win 3.1 and NT will be out. Quarterdeck offers a thirty-day trial version on their Web site (*http://www.quarterdeck.com*). I was very impressed with how easy it was to install and configure, and how well it performed. Considering the price, it's an excellent value. (Quarterdeck Office Systems, 13160 Mindanao Way, Marina Del Rey, CA 90292. 1-800-683-6696)

PageNOW! for Windows

Published By: Mark/Space Softworks
List Price: $119
Review By: Matthew Leeds

It seems like everyone has a pager these days, and many have alphanumeric pagers capable of receiving text messages. At one time you needed to call an operator and dictate a message to be sent to the carrier of an alpha pager, but these days all you need is a computer, a modem, and the right software. Mark/Space's PageNOW! series is the right software. Long available on the Macintosh, this new Windows version brings the polish of an existing product to a new platform.

This version will work with Windows 3.1, Windows 95, and Windows NT. It comes with a large number of configuration guides for commercial paging services, and is a breeze to set-up. You add pager users to a subscriber list, and can track multiple subscribers across multiple services. You can create group paging sets, add canned messages or compose messages on the fly, see previews of how the message will look on sample pagers, track how many characters a pager will display (PageNOW! will automatically break messages up into the maximum a given pager will support), and maintain and examine logs of messages sent.

You may also add greeting and signature files to every page, schedule messages for later delivery, and import/export lists of subscribers. There is also a full DDE link so that you can pager-enable other applications.

Mark/Space makes paging applications for the Web, for email systems, and for the Newton. They make personal and enterprise paging software systems, and their experience with paging applications is evident in the polish this easy-to-use program evidences. (Mark/Space Softworks, 111 W. Saint John St., 4th Fl., San Jose, CA 95113. 408/293-7299. URL: *http://www.markspace.com/pagenow_windows.html*)

Quicken Deluxe 6

Published By: Intuit
List Price: $59.95
Review By: David A. Simon, CPA

Intuit's Quicken is the leading personal accounting software in use today by households and very small businesses. It tracks income and spending, and provides financial planning tools as well. The program also handles online banking, bill payment, and investment tracking.

The Deluxe 6 version adds the latest generation of features, many of which are geared to accommodate services available through the Internet. In tracking investment performance, for example, it scans your drive to identify your browser (e.g., Netscape), logs on, and updates your securities portfolio. The investment tracking features install and run almost completely automatically. Stock quotes, by the way, are free for a year.

For users who don't already have an Internet Service Provider, Quicken Deluxe comes with Netscape and information on connecting to the Net. Intuit also sees that the software is updated

continued on page 218

HSC Electronic Supply

Serving Silicon Valley since 1964!

...brings you a potpourri of high-tech goodies for the techno-tinkerer!
For thirty years we have been your source for Silicon Valley exotica!

Save with Green Switch!

- Green Switch turns your monitor off when not in use!
- Daisy-chains into serial mouse port to detect activity
- Software-selectable functions, audible warning
- Get EPA "Energy Star" compliance for older monitors
- Measures 2.25" x 3.75" x 1.5" with generous cables
- New in box, ninety day warranty

HSC#16511 **$9.95**

Diamond Stealth VLB

- Diamond Multimedia "Stealth-64 Video" Accellerator
- VESA-Local Bus with 64-bit S-3 graphics accellerator chip
- Onboard 1MB DRAM, can be upgraded to 2MB
- Displays up to 800 x 600 pixel, 24-bit true color, or 1152 x 864 pixel, 65K color
- Installation sheet, drivers for Win95, Win 3.XX included
- New in OEM pack bag, 90-day HSC warranty

HSC#16754 DIAMOND MULTIMEDIA **$19.95**

Ultimate Video Hack!

- Only the brave need apply, but what a great gizmo!
- Tiny, postage-stamp sized LCD screens -- in color!
- Fluorescent backlight runs on 5VDC
- Color LCD active area is 14.6mm x 11.2mm
- Overall size of board is 15/16" square!
- Backlight board is 1" square, including tube, inverter
- Resolution is 505 x 230 pixels, RGB delta pattern
- Originally made by Matsushita for virtual reality goggles
- One LCD and one backlight board is $9.95/set
- Buy two sets for only $17.50!
- Includes data sheet with pinouts, specs
- Plastic optics assemblies from Virtual Reality headsets allow viewing images up close
- Surface mount connector available for LCD ribbon cable

HSC# 16536 Tiny LCD/Backlight set **$9.95 ea.**

HSC# 16537 Left & Right Optics units **$7.95 pr.**

PCI Video Accelerator Cards from Media Vision!

Just in...blazing fast and screaming fast "ProAxcel" VGA accelerators from Media Vision! Both support MPEG, AVI, and other full-motion video formats. Check out the review on the Web at http://goinside.com/97/4/pro.html --Both cards are new in box and have a 90-day HSC Warranty

MEDIA VISION PROAxcel

- Blazing fast 64-bit graphic & video card
- PCI Bus card with 1MB RAM, expandable to 2MB
- Uses proprietary chipset (Alliance Semi ProMotion 6410)
- Resolutions up to 800 x 600, 64K colors with 1MB
- Resolutions up to 1600 x 1200, 256 colors (requires 2MB)
- 16M colors at up to 800 x 600 (requires 2MB)
- 30 fps full-screen video playback possible (90MHz Pentium)
- Win95, NT & 3.1 drivers and full manual on CD-ROM
- If you can not read CD's, diskettes are available, $2 extra

HSC#16807 **$29.95**

MEDIA VISION PROAxcel 128

- Screaming fast 128-bit graphic & video card!
- PCI Bus card with 2MB RAM, expandable to 4MB
- Uses Tseng Labs ET6000 chipset, MDRAM technology for incredible 128-bit data path at 75 Hz refresh
- Resolutions up to 1024 x 768, 64K colors with 2MB
- Resolutions up to 1280 x 1024, 16M colors (with 4MB)
- Integrated 135MHz VGA compatible 24-bit DAC
- 30 fps full-screen video playback possible (90MHz Pentium)
- Win95, NT & 3.1 drivers on CD-ROM, printed manual

HSC#16808 **$49.95**

Game Controls for PC's!

Wondering what to do with that old PC now that you have upgraded? Make it into a game system for the kids! Use the controllers below, load up the games and you can have your new computer all to yourself ..for your own games? Better buy extra controllers at these prices!

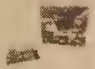
- Kraft KC3 Joystick -- small IBM compatible joystick with dual-axis centering controls, two fire buttons for use with either hand, plus joystick button

HSC#16638 **$1.95**

- Kraft µTrak Mini-trackball -- small trackball has bracket to attach to keyboard -- with carrying case for portability.
- Software disk, Windows compatible

HSC#16641 **$4.95**

- Kraft Game Port Card -- single port can operate two joysticks with Y-cable (not included) Switch selectable bus speeds up to 35 MHz.



HSC#16640 **$1.95**

Tower Case Closeout!

- Looking for an inexpensive case to put that spare motherboard into? Look no further!
- Brand new in box mid-size tower case
- 15" tall, 17"deep, 7" wide
- Includes hardware kit (standoffs, etc.)
- Power supply not included.. inquire about availability of mini-tower supplies to fit.

HSC# 16642 **$19.95**

Sound Card with SCSI

- Mediavision **ProSonic 16** sound card / SCSI controller
- 16-bit audio, 44.1KHz stereo sound
- MPU 401 MIDI emulation, Soundblaster compatible
- Internal SCSI CD-ROM port, microphone jack (mike not included), line-in, speaker jack, joystick port
- Includes driver disk, installation information
- OEM package, 90-day warranty

HSC#16683 **$29.95**

PCMCIA Sound Card

- Turtle Beach Systems "Audio Advantage" Card
- Add multimedia capability to your PCMCIA notebook
- Windows drivers, sound program etc. in "Zip" file
- Adapter plug allows connection of speakers, microphone
- New, OEM packaged, ninety day HSC warranty
- Mfr. offers fax-back or e-mail support for this product

HSC#16521 **$79.95**

Tiny 486 Powerhouse!

- Little box with lots of features...Unisys 486 workstation
- Intel 486DX-33 installed, two SIO, one PIO on board
- Motherboard will accept up to DX2-50 for 100MHz
- On-board VGA (1MB, can add to 2MB), 10-BaseT LAN
- On-board IDE controller, Award BIOS, 256K Cache
- Two 72-pin SIMM sockets, 4MB RAM installed (1 SIMM)
- One short (7") ISA card slot
- 1.44MB Floppy installed
- New, tested, 90 day warranty
- Measures only 11.5" x 8.75" x 2" -- Tiny!
- Install your choice of IDE hard disk drive and go!
- Uses standard PS2-style keyboard & mouse (not incl.)
- Note, we do not have documentation for these units, but a chart on the bottom of the motherboard and the silkscreen legend on the top give most jumper settings.

HSC#16778 **$299.00**

SCSI Device Cases

16560 16559 16558 16575

- Upright Case, 3.5" x 5.5" x 8.125" for 3.5" hard disk drives, 20 watt fan-cooled power supply

HSC#16560 **$29.95**

- Upright Case, same size as above, has front opening, 20 watt power supply, no fan

HSC#16559 **$24.95**

- Horizontal Case, 7.75" x 2.25" x 10", for 5.25" or 3.5" drives, approx 30 watt fan-cooled power supply

HSC#16558 **$39.95**

- Deluxe quality case, 7" x 4.5" x 10.75", mad for Olympus Optical, has 5.25" open front bay, SCSI diagnostic indicator on rear panel, 30 watt fan-cooled power supply, IEC power cord included. Assembled in USA

HSC#16575 **$49.95**

All cases are new, and feature 50-pin Centronics-style daisy-chain connectors, internal 50-pin cable and SCSI ID switch

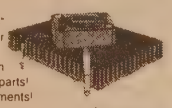
Ethernet Card Closeout

- 10-Base-T style Network card for ISA Bus computers
- NE-2000 compatible, for twisted pair networks
- AE2/T by Artisoft -- Name brand quality!
- New in sealed box, ninety-day HSC warranty
- Driver software is on 5.25" disks -- be forewarned: if you only have a 3.5" drive, you will have to get a friend to copy!
- Note not for "dumb" nodes, does not have boot ROM

HSC#16539 **$19.95**

Peltier Cooler at a Price!

- Made for cooling ceramic Pentium Processors (not metal)
- Heatsink is 2" x 2.875", .5" thick
- Mounted 12VDC fan
- Peltier device is 1.125" square, has copper plate for themal mounting on CPU
- Unit is new, and much cheaper than the separate parts!
- Perfect for Peltier experiments!



HSC# 16106 **$24.95**

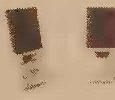
Super Sounding Speakers!

Tired of the cheesy sound coming from those give-away speakers in your multimedia kit? Try upgrading to these sonic wonders.. you'll have to hear them to appreciate the difference these will make without blowing your budget!

GNT2500 2-way Bass-Reflex speakers

- 3.5" woofer, 1" piezo tweeter
- 15W built-in amplifiers, 80W peak, 5.4W RMS
- 40 - 20,000 Hz, built-in SRS 3-D stereo
- Measure approx 3.75" x 6.125" x 9.25" tall
- AC adaptor, audio cables included
- On-off switch, 3-D switch, tone & volume controls
- Attractive off-white finish with grey grille-cloth

HSC#16670 **$29.95**



GNT3500 3-way Bass-Reflex speakers

- 4" woofer, 2" midrange, 1" piezo tweeter
- 23W built-in amplifiers, 120W peak, 20W RMS
- 20 - 20,000 Hz, built-in SRS 3-D stereo
- Measure approx. 6.25" x 6.5" x 9.75" tall
- AC adaptor, audio cables included
- On-off switch, 3-D switch, bass, treble & volume controls
- Attractive off-white finish with grey grille-cloth

HSC#16671 **$39.95**

Infrared PCMCIA Card

- IBM "Options" series PCMCIA card will add industry standard infrared communications capability to your laptop or notebook computer! (May not be Win95 compatible)
- Allows wireless connection to compatible notebooks, workstations, printers, and other peripherals supporting the Infrared Data Association (IrDA) standard.
- Also will emulate a COM port for cable-less hook-ups
- Communicates up to 115KBps, or up to 1.152MBps with the included TranXit Software.
- Operates over distances up to 3 meters (10 ft.)
- Includes Card, transceiver module, driver disk & book
- New in box, 90-day warranty

HSC#16483 ★ NEW PRICE! ★ **$19.95**

New Optical Drive Media

- Generic brand 600 MB double-sided write-once cartridge
- Works with Tahiti III, MOST drives

HSC#16577 **$9.95**

- Maxoptix "Data Lock" 1.0 GB optical glass write-once
- Works in Tahiti IIm multifunctional drives only

HSC#16578 **$14.95**

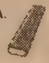
- Maxoptix "Max-GL" 1.3 GB optical glass write-once cart.
- Works with Tahiti, other magneto-optical drives

HSC#16576 **$17.50**

Rock-Bottom Reno!

- This is the Last Stock of Media Vision *Reno*
  - Consists of new external Reno CD/ROM drive, docking bay with SCSI2 port, AC Adapter, cables
  - Uses NiCad battery pack(s), **not included**
  - Double-speed 180mS drive is lightning fast!
  - Drive detaches from docking bay, use with headphones as a portable personal audio CD player
  - Great for Mac or IBM (adaptor bracket included)
  - Mac software included
  - SCSI Controller & software required for IBM use
  - Brand new, 90-day warranty
- **Media Vision *Reno* Kit HSC#15586 includes:** Reno Cable Kit (SCSI2 - DB25 cable, 50p. ribbon cable, internal & external audio patch cables), padded travel pouch, headphones, Mac software, IBM Adapter bracket

A.



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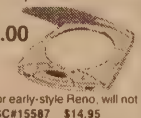

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Gulch GOSSIP

by Jonathan E.

For the latest **CD-ROM** and **software** news & reviews, see our **Product Spotlight** section starting on **page 211**

Web Site To Web Show To Web Lust

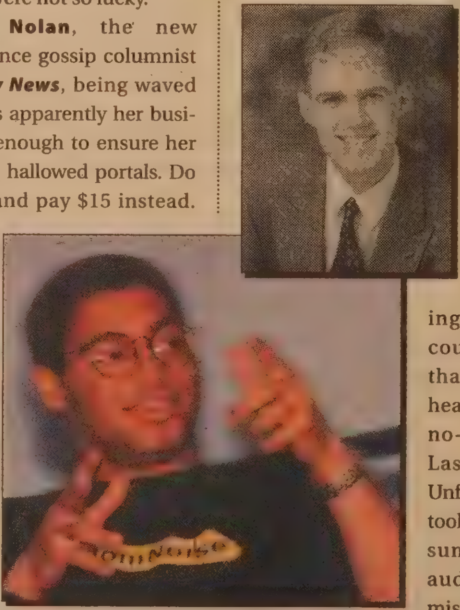
It struck Gulch Gossip as ironic in the extreme that whilst the Multimedia 101 column waxed poetic in Las Vegas over NAB '97, "The Convergence Marketplace," the **Last Saturdays** series of industry schmoozefests presented an evening's worth of, ah!, enlightenment with the theme of "Web Site to Web Show." What's a poor columnist to do? The Lear was stuck jockeying for position amidst the corporate jets of the broadcasting behemoths awaiting permission for takeoff on the runway at McLaren. There was no way to be in two places at once. (Don't worry, some clever computer scientists are already at work on that little problem.) The only thing to do was to deputize a special correspondent.

Luckily for you, such a deputy, perhaps more of an understudy, was poised in the wings. Ladies and gentlemen, a big hand of applause, please, for **Ms. Nina Davis**! Self-described as an Enhanced Data Filter, Ms. Davis has been described by others as a professional cynic, one-time associate editor of ***The Red Herring***, and "this industry's ray of sunshine." Her profound insights, words of wisdom and cutting wit are legendary to those who have the courage, fortitude and wherewithal to pay attention. I now present to you the amazing prose of Ms. Davis:

"Last Saturdays events are never on Saturdays. The one I attended at the SF MOMA was on a Tuesday, April 8. Although I got there at the time the doors were advertised as opening, the 100 or so people waiting to get in were kept waiting around for quite a while in the lovely, extremely brisk San Francisco spring wind. Those of us with VIP invites were able to escape from the cold within 15 minutes or so, but the paying hoi polloi were not so lucky.

"I watched **Chris Nolan**, the new business/technology/finance gossip columnist for the ***San Jose Mercury News***, being waved away from the VIP line, as apparently her business card alone was not enough to ensure her easy entrance through the hallowed portals. Do not pass go, get in line and pay $15 instead. Oooops . . . Why would the idea of trivially and impetuously annoying a Silicon Valley columnist who has just swum up from the shark-infested waters of our nation's capital make me feel just a teensy-weensy frisson of anxiety?

"While still standing in line I noticed some familiar-looking venture capitalists walking by. I hailed **Softbank's Matt Ocko** to ask him if he would be joining these festivities. He explained that he was worn out from attending *The Red Herring*'s conference, **Web Market West**, held that day at the ANA Hotel down the street at the trifling cost of $1359 per attendee. (Suddenly Last Saturdays seemed like a bargain after all.) Before wandering on his merry way, Matt did introduce me to **Marc Benioff**, tall and not bad-looking and once described to me as 'Oracle's number-two womanizer.' Glimpsing him later on in the evening in a series of what I assumed to be deeply philosophical conversations with a variety of rather anemic albeit perky-looking blondes provided me with several snickers of quiet amusement.



Oliver Muoto of RandomNoise; inset: Adrian Scott of Aereal

"Once inside, needing a warming drink to counteract the effects of that chill wind outside, I headed for the traditional no-host and over-priced Last Saturdays bar. Unfortunately, in the time it took me to obtain and consume my beverage, the auditorium filled, so I missed the panel. Since I'd surrendered my invitation at the door and since Last Saturdays has no Web site to conveniently check who was on the show, I mean the panel, I cannot inform you fully as to what industry luminaries spouted what clichés. However, once the panel was over and the lucky

275 granted entrance had returned, uplifted and further educated, from the auditorium, I spotted **Soledad O'Brien**, the panel's moderator and host of MSNBC's **The Site**. I wanted to ask her if she'd had fun moderating the discussion. I fought my way through the entourage of eager males surrounding her. (Sorry, guys, I've heard from more than a few of you that she's the 'hottest babe' on the Net and in the Valley—after or in conjunction with **Marimba's CEO**—but, as far as I know, Soledad is happily married.)

"Soledad said the panel went well, and, naturally, **Bob Ayres**, the host of these events, agreed. Most of the attendees I spoke with concurred that Bob gets apparently interesting panelists, even if what they have to say at these events is sometimes a little less inspiring than what one expects of them. No doubt memories other than mine also recall **Ann Winblad**'s distressingly kindergarten-level explanation of venture funding a tech company or **Vint Cerf**'s mildly fatigued 'special Internet remix speech' at earlier Last Saturdays events.

"Okay, so this audience is not super-sophisticated, but a bunch of bright, well-informed tech and finance geeks continue to show up, so is it really necessary to offer the lowest-common-denominator content that the panel participants can come up with? How about organizing the talks so that the people most deeply interested in the subject can enjoy the discussion, and frivolous dilettantes like myself can wander off to network and scrounge for appetizers? That might reduce the number of frightfully clever folks hanging out at the bar making witty remarks at the expense of the event to any impressionable young minds who will listen to them.

"That of course is what I ended up doing. After wandering around to look at the demos I regretted that the museum's exhibits could not be looked at instead. I found my way over to a knot of people commiserating about the sad fate of VRML companies. Talk of **Worlds Inc.** about to be acquired, **Black Sun Interactive** heading towards a black hole, and layoffs galore made a sad elegy for the new standards and latest greatest thing in the cyberspace of just last year.

"Then **Adrian Scott**, CEO of **Aereal**, who now appears to be focusing more on Java and 'personalized Internet marketing and publishing' (sounds pushy to me) than on VRML these days, started handing out stick-on name tags of the 'Hi, I'm . . .' variety. His said 'Hi, I'm going to give you a tag.' Another one of his creations said, rather inaptly, 'Hi, I'm short and sweet.' I was awarded 'Hi, I'm Evil Incarnate.'

"A little while later, when I finally got a chance to have a little gossip-columnist-to-gossip-columnist chat with Chris Nolan, I apologized for my nametag, explaining that I hadn't meant to appropriate her title. She modestly replied, 'You can be Evil Incarnate as much as you want, honey. I'm not Evil Incarnate tonight; I'm the Antichrist.' Did that sum up the evening, or the company I like to keep? Not quite. As I prepared to depart, taking a last look at the throng of people schmoozing, cruising, desperately seeking sustenance and substance, someone asked me, 'So why do you keep attending these industry parties?' Absent-mindedly brutal, I responded, 'I haven't owned a television since 1989. This is where I go for soap-opera.'"

Thank you, Ms. Davis, for a fine bit of industry schmoozing with the claws out. Let's hear it for Ms. Davis. Perhaps she'll grace us with an encore. Ladies and gentlemen, once more for Ms. Davis! Ahh! Here she is!

"And then there was **New York.** Another fine location for real-life, real-time dramedy. I was out on the East Coast at the end of April for reasons other than the first Manhattan Last Saturdays event, but wandering the Seybold show floor turned up an invite, so I determined to attend. I obtained a seat on the graciously-provided-by-Seybold-and-Last-Saturdays-but-crammed-to-overflowing shuttlebus. During the ride my ears were assaulted by the incessant, incredibly loud, buzzing sound of heavy networking in the aisle. I had the dubious privilege of being the object of a particularly fine example of that strange combination of instant male posturing and bonding. **A Paul**, a British ex-theatrical marketing maven turned into a bit of a talent scout for the likes of Adobe, and **an**

continued on page 218

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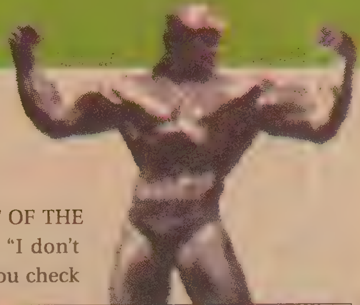
Superbad Mystery



DOUG MILLISON POPPED UP OUT OF THE aether with a cryptic little email, "I don't know who did this, but I suggest you check it out." The subject line? "**www.superbad**." So I did. If you're interested in perusing an intriguing but well-executed, entangled series of Web pages with no apparent commercial purpose—perhaps they're even electronic art—so should you.

Coolest Clothing

THE COOLEST CYBERWEAR I'VE SEEN LATELY WAS A JACKET WITH "**KEY Escrow Agent**" emblazoned across the back in law-enforcement style lettering. No! Of course, I'm not going to tell you who was wearing it!

Obligatory Wired Item

I'M SO GLAD ***WIRED*** FINALLY RELEGATED ***MULTIMEDIA GULCH*** TO THE **Tired** column in its May issue. No doubt it will no longer refer to itself so pompously as a "multimedia event on paper." With **Silicon Tundra** now in the *Wired* column, perhaps it could hype itself as "lichen growing on paper." Perhaps not; while lichen is almost as brilliantly colored as *Wired's* famous inks, it requires clean air, something in notoriously short supply when you're almost under the freeway. Besides, most of the air around 520 3rd St. is too hot already.

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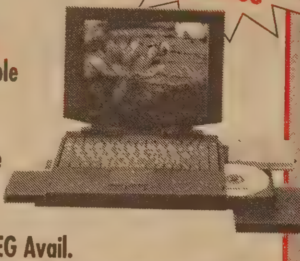

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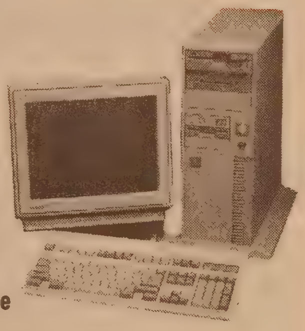

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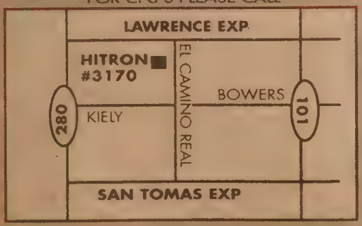

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GULCH GOSSIP

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Antoine, some sort of music-industry promoter and proponent of 'coolness,' possibly from the West Indies by way of L.A., London, or New York, vied for my attention with profuse talk of the better clubs and the inside world of entertainment. It was a trifle overwhelming to one so terminally uncool and determinedly unhip as myself. Eventually my lack of appropriate female ga-ga response sunk me in their esteem and they descended to calling me 'an ice queen.' I arrived at this Last Saturdays feeling even more cynical than usual.

"Of all the possible places in Manhattan, Last Saturdays was held in a not overly-large space that I actually knew—next to the premises of Web-and interface-design company **SenseNet**. When I'd spent a technologically informative and somewhat tipsy evening there a few months earlier the club next door had not yet opened, and here I was, actually able to verify that the space lived up to its promise of being 'cool.' I congratulated Bob Ayres on expanding the territory of his operations, for which he promptly offered me a drink and the information that he was launching Last Saturdays in yet another territory. Random people introduced themselves to me, including what I vaguely remember as the head networking geek for the database of the catalog for either **Sears** or **JC Penney**. And there was some guy in offset printing who tried to tell me about cows and satellite images. . . . Just another typical Last Saturdays?

"From the California contingent, I ran into **Oliver Muoto**, marketeer for **RandomNoise**, looking lost and forlorn without the posterboards he'd been lugging around on the shuttlebus. Presumably he'd deposited the posterboards somewhere visible (though unseen by me) as RandomNoise was one of the co-sponsors of the event. (BTW, what was RandomNoise doing at a primarily publishing show?) I thought I caught a glimpse of **Freddy Krueger**, RandomNoise's CEO, doing his washed-up impression of a down-and-out **Marc Andreessen**. I also chatted with **Ann Marcus**, earlier working on generating interest in yet another Web conference, an uphill task considering the veritable cornucopia of conferences already extant. Now she simply relaxed as best she could as we fended off the incoherent attentions of yet another maladroit geek. I saw tall **Eric Taller** in a suit, which I'd certainly never seen him in during his involvement with ***Morph's Outpost***. However, his move to the more corporate **InterActivity** must have required the tie.

"Someone asked me if that was Soledad O'Brien over there, but, Seybold undoubtedly not being cool and mass-market enough to require Soledad's presence, it was only someone named **Carmen** handing out Seybold sunglasses and miniature soapbubble-blowing equipment. The exit beckoned nearby, and blowing bubbles, as fragile and sticky as industry hype, I left, to partake of some revivifying sushi, sake, and California sunshine."

Thank you, thank you, Ms. Davis. We are proud to have provided you with a stage from which to squirt your venom. Now I'd just like to let the audience know that if any of you would like to pay Ms. Davis a lot of money for trenchant analysis of the social customs prevailing among geeks and high-tech marketing folks, or would just like to ask her nasty questions, or can offer her a position as full-time Devil's Advocate, that she can be reached via email at *nina@weblust.com* . For extraordinarily large sums of cash or rapidly appreciating stock in high-growth companies, Gulch Gossip will even reveal her phone number. Thank you again and good night, ladies and gentlemen. ■

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Product Reviews

continued from page 212

via the Net at any point during the year with practically no user effort.

The interface meets expectations of those who think of instructions as something to be referred to only as a last resort. In such instances, however, help screens include audio coaching and on-screen animated video to demonstrate program features.

Other pluses in the new version are longer field lengths for account names and memos. This fix corrects a longstanding frustration that field sizes had been too small to adequately enter transaction descriptions that mean something to us inelegant, linear thinkers.

To prevent you from making frustrating mistakes, the program recognizes frequent errors before you acknowledge them, and prompts you with on-screen reminders, so you don't feel all alone with your bookkeeping.

A single CD contains both the Windows 3.1 and Windows 95 versions. The Windows 95 version, being a 32-bit application, is designed to run faster. (Intuit Corp., P.O. Box 7850, Mountain View, CA 94039-7850. 1-800-4-Intuit. URL: *http://www.intuit.com/quicken97/*)

Book Review

Running Microsoft Windows NT Server 4.0

By: Charlie Russel and Sharon Crawford
Published By: Microsoft Press
List Price: $39.95
Review By: David A. Simon, CPA

Running Microsoft Windows NT Server 4.0 provides practical guidance that is ideal for businesses looking to build a network based on NT servers.

The NT network operating system has been around for several years and through several versions. Only with the release of v4.0, however, has it begun to have a major impact on the corporate networking market. In the market-share battle with Novell, NT is steadily gaining ground, particularly with small- and medium-sized businesses.

What distinguishes this volume from other NT server books is its practical and concise approach. Not only can the reader easily dip into it for specific information, it's also a complete guide to planning and running a successful network. The first five chapters are, in fact, all about planning. The rest of the book is step-by-step guidance on areas ranging from installation to disaster recovery to co-existence with Novell.

The authors give straightforward advice on potential pitfalls, with an emphasis on how a manager can maintain both control and a user-friendly environment. Here, you'll find the most thorny concepts in networking such as domains, TCP/IP, and shares v. permissions discussed with admirable clarity and brevity. The language is only as technical as it needs to be, and descriptions are understandable the first time they're read.

At just over 600 pages, it is designed for everyday use, rather than as a substitute for the rather daunting five volume *Windows NT Resource Kit* also produced by Microsoft Press. *The Resource Kit* is good for looking up technical specifications but when it comes to realistic advice and quick answers, *Running Microsoft Windows NT Server 4.0* is far more useful. (Microsoft Press, One Microsoft Way, Redmond, WA 98052-6399. URL: *http://www.microsoft.com/products/mspress*) ■

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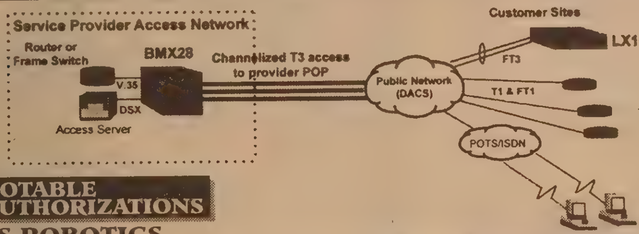

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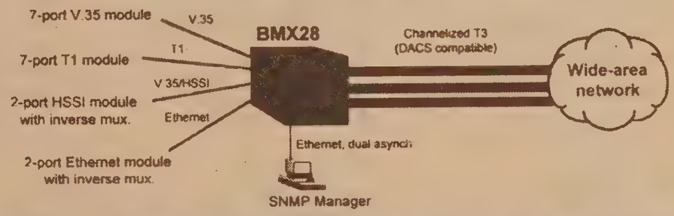

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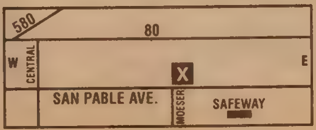

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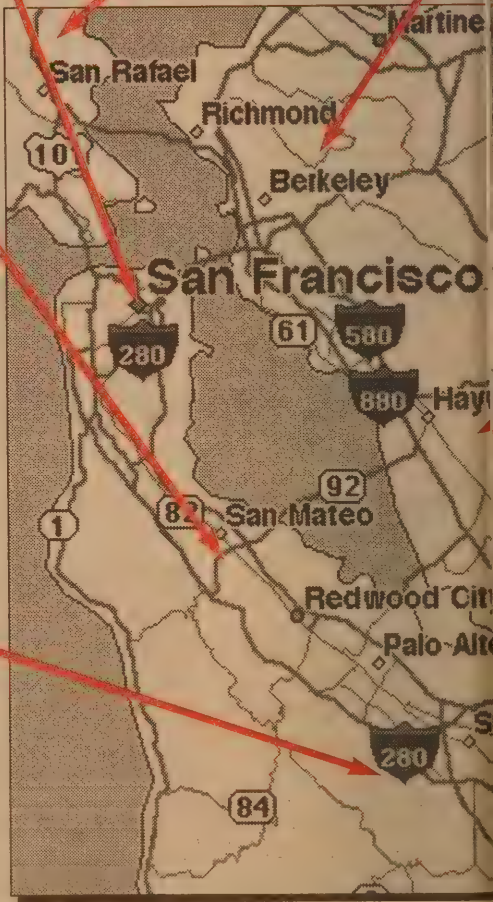

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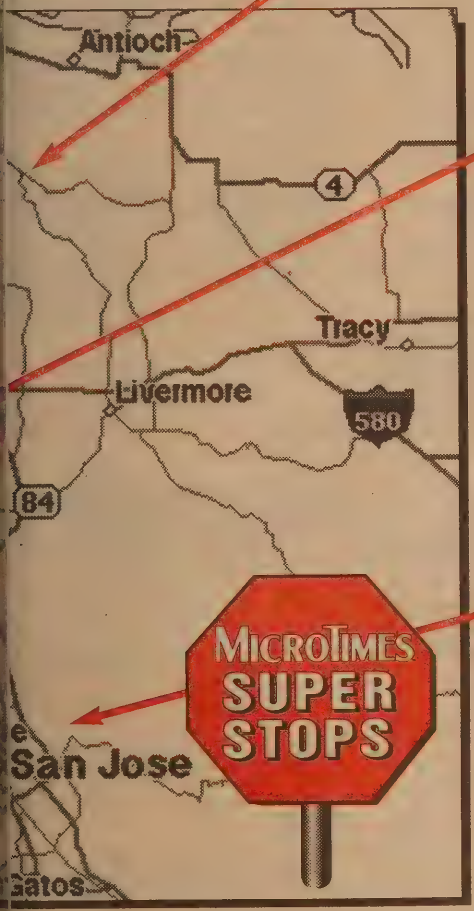

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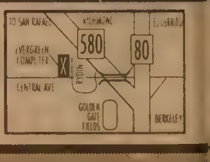

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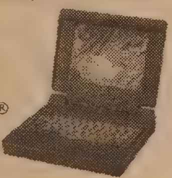

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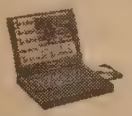

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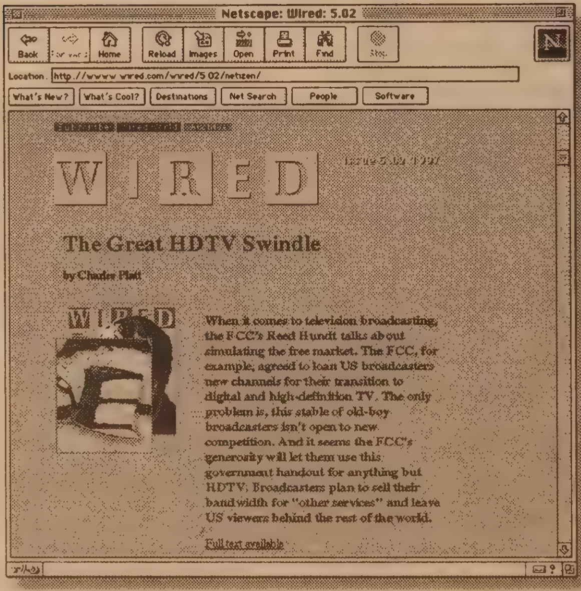

http://wwww.wired.com/wired/5.02/netizen/

The Great HDTV Swindle

by Charles Platt

When it comes to television broadcasting, the FCC's Reed Hundt talks about simulating the free market. The FCC, for example, agreed to loan US broadcasters new channels for their transition to digital and high-definition TV. The only problem is, this stable of old-boy broadcasters isn't open to new competition. And it seems the FCC's generosity will let them use this government handout for anything but HDTV. Broadcasters plan to sell their bandwidth for "other services" and leave US viewers behind the rest of the world.

Full text available

Two tectonic time-plates of broadcasting, the pre-digital and the digital, ran into each other just before NAB '97, the annual convention of the National Association of Broadcasters held in Las Vegas. The resultant series of earthquakes will likely rupture the mediascape for years to come. Convergence is the buzzword for this era of upheaval as television, computers and telephones mate and mutate. It sounds almost biological, a natural process, but it's more like convergence in the sense of armies meeting on the battlefield to clash in bloody confusion. As you should expect in any arena with even a whiff of computers and media, Microsoft is one of the combatants. The peculiar sight of NAB '97 was that, in contrast to most computer trade shows where Microsoft is a Goliath, here at a broadcasting trade show Microsoft appeared more as a diminutive David.

In its role as David, Microsoft hopes that it and its allies in the Computer Industry Coalition on Advanced Television Service (CICATS) have fashioned a slingshot out of the influence they exerted upon the rules for the transition to digital broadcasting of television signals. The story of the long road to eventual replacement of the antiquated National Television System Committee (NTSC) broadcasting standard detours through the mid-'80s perceived threat of the Japanese development of High Definition Television (HDTV) before the later emergence of digital signals, multimedia on the Internet, and the current "plans" or "rules" for implementing digital broadcasting. 'Tis an oft' told tale of political dealing and influence peddling that, along with concomitant technical detail and some appropriate outrage at the dinosaur broadcasting industry's pigging out at the trough of the public airwaves, was well recounted at some considerable length by Charles Platt in the February 1997 issue of *Wired*; you may—and should—read the full story at *http://wwww.wired.com/wired/5.02/netizen/*.

In this column's abbreviated and updated version of the tale, Microsoft and CICATS armed themselves for the future battle by cutting a

continued on page 231

BY JONATHAN E.

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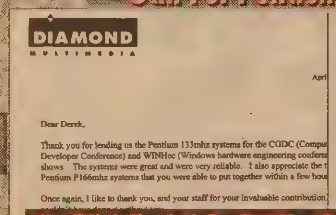

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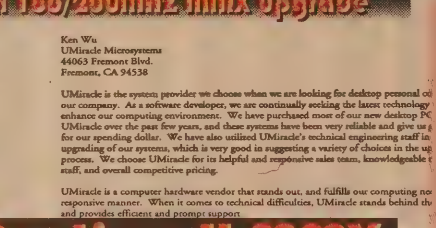
April

Dear Derek,

Thank you for lending us the Pentium 133mhz systems for the CGDC (Compu Developer Conference) and WINHec (Windows hardware engineering confere shows. The systems were great and were very reliable. I also appreciate the t Pentium P166mhz systems that you were able to put together within a few hou

Once again, I like to thank you, and your staff for your invaluable contribution



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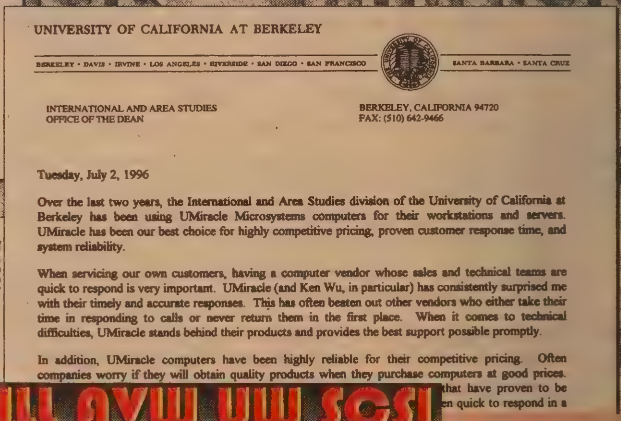

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BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO — SANTA BARBARA • SANTA CRUZ

INTERNATIONAL AND AREA STUDIES
OFFICE OF THE DEAN

BERKELEY, CALIFORNIA 94720
FAX: (510) 642-9466

Tuesday, July 2, 1996

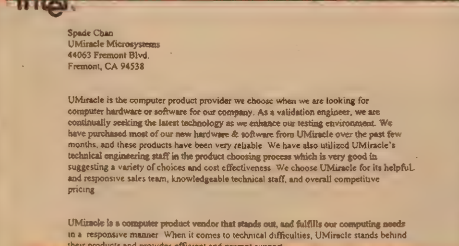
Over the last two years, the International and Area Studies division of the University of California at Berkeley has been using UMiracle Microsystems computers for their workstations and servers. UMiracle has been our best choice for highly competitive pricing, proven customer response time, and system reliability.

When servicing our own customers, having a computer vendor whose sales and technical teams are quick to respond is very important. UMiracle (and Ken Wu, in particular) has consistently surprised me with their timely and accurate responses. This has often beaten out other vendors who either take their time in responding to calls or never return them in the first place. When it comes to technical difficulties, UMiracle stands behind their products and provides the best support possible promptly.

In addition, UMiracle computers have been highly reliable for their competitive pricing. Often companies worry if they will obtain quality products when they purchase computers at good prices. that have proven to be en quick to respond in a

OUR SERVICE, OUR COMMITMENT

- [illegible] systems [illegible] drivers and switches setup/configured. Windows 95/NT and all included software installed for [illegible] purpose, high resolution video monitor mode tested and continuously burned in for 48 hours on all components and finally [illegible] inspected for trouble-free operation. All systems are to be inspected by customer at pick up time.
- Most advertised standard configurations have been pre-built, burn-in tested and are ready to be picked up or delivered within 60 minutes IN FREMONT MAIN OFFICE - Please allow more time for minor configuration changes. Standard delivery time is 72 hours.
- Free delivery area includes local area within 30 minutes driving distance. No delivery on weekends. Delivery out of local area will be charged up to $30 freight.
- Most components come with over 1 year manufacturer warranty - First year will be covered by UMiracle. Warranty after the first year will be covered by component manufacturers.
- While-you-wait immediate service should there be any necessary warranty repair. If we couldn't solve the problem, another system will be built (at our discretion, if purchased within 30 days.)
- All [illegible], repairs, exchanges, upgrades can be done in either Fremont, Belmont or Albany store. Original invoices & records required.

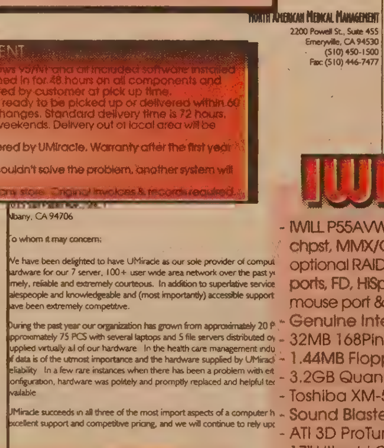


intel

Spade Chan
UMiracle Microsystems
44063 Fremont Blvd.
Fremont, CA 94538

UMiracle is the computer product provider we choose when we are looking for computer hardware or software for our company. As a validation engineer, we are continually seeking the latest technology as we enhance our testing environment. We have purchased most of our new hardware & software from UMiracle over the past few months, and these products have been very reliable. We have also utilized UMiracle's technical engineering staff in the product choosing process which is very good in suggesting a variety of choices and cost effectiveness. We choose UMiracle for its helpful and responsive sales team, knowledgeable technical staff, and overall competitive pricing.

UMiracle is a computer product vendor that stands out, and fulfills our computing needs in a responsive manner. When it comes to technical difficulties, UMiracle stands behind their products and provides efficient and prompt support.



NORTH AMERICAN MEDICAL MANAGEMENT
2200 Powell St., Suite 455
Emeryville, CA 94530
(510) 450-1500
Fax: (510) 446-7477

bany, CA 94706

o whom it may concern:

We have been delighted to have UMiracle as our sole provider of compu ardware for our 7 server, 100+ user wide area network over the past y mely, reliable and extremely courteous. In addition to superlative service alespeople and knowledgeable and (most importantly) accessible support ave been extremely competitive.

During the past year our organization has grown from approximately 20 P pproximately 75 PCS with several laptops and 5 file servers distributed o upplied virtually all of our hardware. In the health care management indu f data is of the utmost importance and the hardware supplied by UMirac eliability. In a few rare instances when there has been a problem with e onfiguration, hardware was politely and promptly replaced and helpful te vailable.

UMiracle succeeds in all three of the most import aspects of a computer h xcellent support and competitive pricing, and we will continue to rely up

IWILL AVW UW SCSI

- IWILL P55AVW ATX mother board w/ Built-in Adaptec® 7880 (2940UW UltraWide SCSI), Intel 430VX chpst, MMX/Cyrix 686 CPU support, 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Pipelined 512K Cache, 3 PCI+4 ISA slots, 72Pin SIMM & 168PIN DIMM, PCI-IDE ports, FD, HiSpd I/O, USB, 50Pin+68Pin Wide SCSI + FD/HD/IO cables, Musical alarm CPU fan, PS/2 mouse port & EZ-SCSI V4.0L + complete Adaptec® software driver & manual included
- Genuine Intel Pentium® Processor w/ Alarm Cooling Fan
- 32MB 168Pin 12ns SDRAM DIMM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HD
- Toshiba XM-5702 TwelveSpeed IDE 1800KB/S CD-ROM
- Sound Blaster Compatible ESS 16Bit PnP Stereo Sound Card
- ATI 3D ProTurbo PC2TV 4MB SGRAM Video Card
- 17" Hitachi CM-620 .28DP 1280x1024NI Monitor
- GigaStar ATX style Medium Tower 235W ATX PS
- KeyTronic 104 Key Win95 PS/2 Keyboard
- Logitech MouseMan PS/2 Mouse w/ Pad
- Pair of 80Watt Stereo Speakers
- Legitimate MS Windows 95 Full CD + Manual + installed + fully-configured

Intel Pentium®	
133MHz	$1846
166MHz	$1916
200MHz	$1967
mmx166	$1981
mmx200	$2195

Optional:		
	MS DOS V6.22 + Windows V3.11	Add$10
	MS DOS V6.22 + Windows for WorkGroup V3.11	Add$30
	Windows NT 4.0 Workstation/Server	Add$55/$460

UMiracle

UMiracle Microsystems
44063 Fremont Blvd. Fremont CA 94538
Phone 510-226-3666 Fax 510-226-6758
Email: sales@umiracle.com
1035 San Pablo Ave#1, Albany CA 94706
Phone 510-526-2626 Fax 510-526-0273
Email: sales@albany.umiracle.com
1501 #6 El Camino Rl Belmont CA 94002
Phone 415-592-3333 Fax 415-592-2919
Email: sales@belmont.umiracle.com

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Ph:510-526-2626
1035 San Pablo Ave #1

Albany Exit
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Gilman St

Off I-80 Albany Exit, go toward the hill and turn right on San Pablo Avenue. We are facing U.C. Village. Or off I-80 Gilman St, go toward the hill and make a left turn on San Pablo Ave.

Belmont Store

Ph:415-592-3333
1501 El Camino Real #6

Sunday: 10:30AM-6:00PM
Yes! Open on Sunday!

Ralston
Habor
Holly
Old County Rd
UMiracle
El Camino Real

From north or south, Off I-101 Ralston Ave, go towards west, left on El Camino Real and make a U-turn ASAP. We are on your right.

Fremont Main

44063 Fremont Blvd

Auto Mall Pkwy.(Old Durham Rd)
S80N
Grimmer Blvd.
Technology Dr.
UMiracle
Fremont Blvd.

Off I-880 Auto Mall Pkwy East, pass Technology Drive and make a right on Fremont Blvd, (or off 680 Durham, go west, pass Osgood Rd, then make a left on Fremont Blvd.) first driveway on your right.

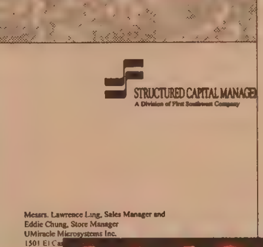
AND BE A WINNER!

Intel Venus P6 Pentium® Pro

- Intel Venus Performance/VS Pentium® Pro motherboard w/256K Built-in CPU Cache, Intel® 440FX chpst, w/onbrd BusMaster IDE, HiSpd I/O, FD, PS/2 Keybrd+mouse ports, ZIF Socket 8, AMI PnP Flash BIOS, FP/EDO 72Pin SIMM upto 256MB, ATX Form Factor board
- Genuine Intel Pentium® Pro Processor w/ Cooling Fan
- 32MB=16MBx2 60ns 72Pin EDO SIMM RAM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33240A Mode 4 E-IDE HD
- Toshiba XM-5702 TwelveSpeed IDE 1800KB/S CD-ROM
- Creative Lab Sound Blaster 32 PnP Stereo Sound Card
- ATI 3D ProTurbo PC2TV 8MB SGRAM Video Card
- 17" Hitachi CM-620 .28DP 1280x1024NI Monitor
- GigaStar ATX style Medium Tower 235W ATX PS
- Liton SK6000 Ergonomic Win95 PS/2 Keyboard
- Logitech 3-Button MouseMan PS/2 Mouse w/ Pad
- Pair of 80Watt Stereo Speakers
- Legitimate MS Windows NT v4.0 Workstation CD + Manual [illegible]

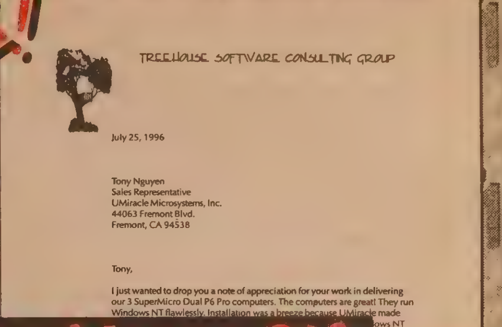
Pentium® Pro

150MHz 256k	$1819
180MHz 256k	$2014
200MHz 256k	$2140
200MHz 512k	$2670



STRUCTURED CAPITAL MANAGE
A Division of First Southwest Company

Messrs. Lawrence Ling, Sales Manager and
Eddie Chung, Store Manager
UMiracle Microsystems Inc.
1501 El Ca
Belmont, C



TREEHOUSE SOFTWARE CONSULTING GROUP

July 25, 1996

Tony Nguyen
Sales Representative
UMiracle Microsystems, Inc.
44063 Fremont Blvd.
Fremont, CA 94538

Tony,

I just wanted to drop you a note of appreciation for your work in delivering our 3 SuperMicro Dual P6 Pro computers. The computers are great! They run Windows NT flawlessly. Installation was a breeze because UMiracle made ows NT d your

Intel Providence P6²

- Intel Providence PR440FX Dual Pentium® Pro processor-based board - Intel 440FX PCISet, support Dual Pentium® Pro 200Mhz CPUs, EDO ECC 168Pin DIMM upto 512MB, Integrated LAN Controller Intel 82557 (=EtherExpress® Pro/100B), Integrated Ultra/Wide SCSI Adaptec® 7880 w/ onbrd+External mini-68Pin 16bit Wide Connectors, Integrated Audio - Crystal+Yamaha OPL3 FM Synthesizer 16bit Stereo Sound, 4 PCI+1 ISA slots, onbrd PCI Bus Master IDE interfaces, HiSpd I/O, FD, Dual ZIF Socket 8, Flash AMI PnP BIOS, ATX form Factor
- Genuine Intel Pentium® Pro Processor(s) w/Cooling Fan(s)
- 64MB=64MBx1 168Pin 8Mx72 EDO ECC Buffered DIMM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HD
- Toshiba XM-5702 TwelveSpeed IDE 1800KB/S CD-ROM
- ATI 3D ProTurbo PC2TV 8MB SGRAM Video Card
- 21" Hitachi CM-800U .22DP 1600x1200NI 75Hz Monitor
- GigaStar ATX style Full Tower 235W ATX PS
- Liton SK6000 Ergonomic Win95 PS/2 Keyboard
- Logitech 3-Button MouseMan PS2 w/ Pad
- Pair of 120Watt Stereo Speakers
- Legitimate MS Windows NT V4.0 Workstation CD + Manual + installed + fully configured

	Single	Dual
180MHz 256k	$3536	$3930
200MHz 256k	$3663	$4185
200MHz 512k	$4198	$5253

Portland Pentium II

PII is here!

- Intel Portland PD440FX Pentium II ATX Motherboard - Boxed version, 233-266MHz Supported, 440FX Chipset, 3 ISA+3 PCI Slots, 512K Cache on Pentium II CPU Cartridge, 4 - 72Pin SIMM Slots, Onboard Super I/O/FD/IDEs/ PnP Yamaha POL3 Integrated Audio
- Intel Pentium® II 512K Processor w/ Cooling Fan
- 32MB=16MBx2 60ns 72Pin EDO SIMM RAM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33260A Mode 4 E-IDE HD
- Toshiba XM-5702 TwelveSpeed IDE 1800KB/S CD-ROM
- ATI 3D ProTurbo PC2TV 8MB SGRAM Video Card
- 20" Hitachi CM-2011MU .28DP 1600x1200NI Monitor
- Premium ATX style Full Tower 235W ATX PS
- Liton SK6000 Ergonomic Win95 Keyboard
- Logitech 3-Button MouseMan Serial Mouse w/ Pad
- Pair of 120Watt Stereo Speakers
- Legitimate MS Windows NT V4.0 Workstation CD + Manual + installed + fully configured

Intel Pentium® II

233MHz	$3063
266MHz	$3195

NoteBook Options:		
	MS DOS V6.22 + Windows V3.11	Add$100
	MS DOS V6.22 + WFWG V3.11	Add$120
	Windows 95 CD Full OEM Version	Add$90
	Windows NT 4.0 Workstation/Server OEM	Add$140/$550

CHEM 9750 NoteBook Options

EDO DIMM 16MB=8X2pc	$105
EDO DIMM 32MB=16X2pc	$210
Auto Adaptor 12V	$75
AC Adaptor	$79
NiMH 2nd Battery	$115
Li-Ion 2nd Battery	$225
Battery Charger	$95
Port Duplicator	$150

NoteBook Harddrive/Accessories

1.0GB 2.5" IDE Slim HD	$225
1.4GB 2.5" IDE Slim HD	$265
2.1GB 2.5" IDE Slim HD	$395
PCMCIA 33.6 Fax/Data	$189
PCMCIA Ethernet Comb	$89

CHEMBOOK 9750 ■ P5 CPU upto 200MHz ■ Active Screen 12.1"/13.3" ■ 16MB EDO onbrd ■ 256K PB L2 Cache ■ 1.44FD ■ 10xSpeed CDROM ■ 2MB EDO Video RAM ■ NiMh Battery ■ 16Bit Stereo Sound ■ Video Catpure Port ■ IS/IP ports ■ InfraRed port ...

(1.0/1.4/2.1GB HD)	Active Matrix 12.1"	Active Matrix 13.3"
■ P5-133Mhz	$2199/$2230/$2340	$2934/$2965/$3075
■ P5-166Mhz	$2270/$2301/$2411	$3005/$3036/$3146
■ P5-200Mhz	$2319/$2351/$2461	$3054/$3086/$3196

Call for Intel Pentium 166/200MHz MMX Upgrade.

MULTIMEDIA NOTEBOOKS

CHEM 6800 SPECIFICATIONS

- Intel Pentium 100/120/133/166/200MHz
- Pipelined Synchronous 256K Level-2 Cache
- 12.1" Active Matrix Screen
- 2MB EDO Video RAM on PCI v2.1 Bus
- Expandable EDO Memory up to 64MB
- 800x600x16M True Colors
- 64Bit PCI bus with graphics accelerators
- SystemSoft flash BIOS with Plug & Play
- Built-in 11X CD-ROM
- 16Bit Stereo sound System
- 3 x Type II or 1 x Type II+1 x Type III (Support Zoom Video Port)
- Modem Ring in wake up on Power Mgmt
- Built-in 1MB Mask ROM hardware wavetable
- Removeable Floppy & hard drive
- Infra-red IrDA and FIR
- RCA jack for TV-Out
- Windows 95 Keyboard

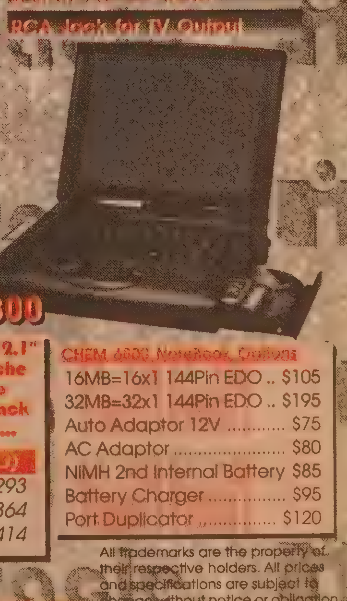
FD replaceable w/2nd Battery

Upto 64MB EDO memory

Large 12.1" Active Color

Built-in 11X CD-ROM

RCA Jack for TV Output



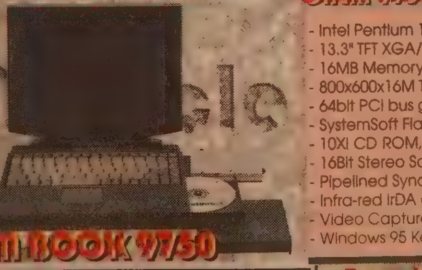
Large 13.3" Active Color

FD Replaceable w/2nd Battery

Video Capture Port Built-in

Upto 80MB Main Memory

Lithium-Ion Battery Option



CHEM 9750 SPECIFICATIONS

- Intel Pentium 120/133/150/166/200MHz/MMX
- 13.3" TFT XGA/12.1" TFT SVGA or Dual Scan
- 16MB Memory onbrd, expand upto 80MB
- 800x600x16M True Colors, 2MB Video RAM
- 64bit PCI bus graphics accelerator
- SystemSoft Flash BIOS with PnP
- 10XI CD ROM, exchange w/FDD or Battery
- 16Bit Stereo Sound System
- Pipelined Synchronous 256K Level-2 Cache
- Infra-red IrDA and FIR
- Video Capture port
- Windows 95 Keyboard

CHEM BOOK 9750

CHEM BOOK 6800

CHEMBOOK 6800 ■ P5 CPU ■ Active 12.1" ■ 16MB EDO 144PinDIMM ■ 256K L2 P.B. Cache ■ 1.44FD ■ 11X CDROM ■ 2MB EDO Video ■ TouchPad ■ 16Bit Stereo Sound ■ RCA Jack ■ IS/IP ports ■ NiMH Batt ■ InfraRed port ...

Active Matrix 12.1"	(1.0/1.4/2.1GB HD)
■ Pentium-133Mhz	$2151/$2183/$2293
■ Pentium-166Mhz	$2222/$2253/$2364
■ Pentium-200Mhz	$2272/$2304/$2414

CHEM 6800 NoteBook Options

16MB=16x1 144Pin EDO	$105
32MB=32x1 144Pin EDO	$195
Auto Adaptor 12V	$75
AC Adaptor	$80
NiMH 2nd Internal Battery	$85
Battery Charger	$95
Port Duplicator	$120

UMiracle
UMiracle Microsystems

- Free Local Area Delivery for System Purchase
- 1 Year Parts + Life Time Upgrade Labor Warranty on Systems
- Expertise Technical Support On Duty Daily
- While-You-Wait Immediate Replacement/Repair Service
- 30 Day Compatibility Guarantee on Complete Systems

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What is RAID?

RAID is an acronym for Redundant Array of Inexpensive (or Independent) Disks. A RAID array is a collection of drives which collectively act as a single storage system, which can tolerate the failure of a drive without losing data, and which can operate independently of each other. Among all RAID implementations, RAIDport, the latest Adaptec RAID 5 solution, is the most cost-effective way to protect your data. If the data in your file server is vital to your survival of your business, RAID-5 is the way to go!

RAID-5 Pentium Pro² Server

- IWILL DP6NS Dual Pentium® Pro processor-based board w/Built-in Adaptec® PCI SCSI chipset 7880 (AHA-2940UW Ultra Wide SCSI), 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Intel 440FX chipset, ZIP Socket 8, 150-233Mhz, 3 PCI+4 ISA slots, FP or EDO 72Pin SIMM & support upto 512MB, built-in PCI-IDE interfaces, FD, 2-16550 UARTs, ECP/EPP, support 4 IDE HDs, PnP, 50pin SCSI + 68pin Wide SCSI + FD/HD/IO cables, PS/2 mouse port & EZ-SCSI V4.0L + complete Adaptec® software driver & manual included
- Adaptec RAID 1130 daughterboard - upgrades IWILL P6NS2 to support hardware assisted RAID 0,1,0/1,5, complete Adaptec Viking Software for NT, Novell, Unix, 4MB cache memory installed for speedy performance
- Genuine Intel Pentium® Pro Processor(s) w/ Cooling Fan(s)
- 32MB=16MBx2 60ns 72Pin EDO SIMM RAM
- 1.44MB Floppy Drive
- Toshiba XM-5702 12XSpeed IDE 1800KB/S CD-ROM
- Four 3 2GB Quantum FireBall ST33240S Ultra-SCSI-2 HDs
- Trident 9680 PCI 1MB MPEG+AVI Video Card
- 14" ShamRock 1Kx768NI Pwr-Saving Monitor
- GigaStar ATX style Full Tower 235W ATX PS
- KeyTronic 104 Key Win95 PS/2 Keyboard
- MicroSoft Ergonomic Serial Mouse w/ Pad
- [illegible]

P6² is here!

	Single	Dual
150MHz 256k	$3293	$3484
180MHz 256k	$3496	$3690
200MHz 256k	$3627	$4152
200MHz 512k	$4176	$5251

RAID-5 AMI Quad P6

- AMI (American Megatrends, Inc) Goliath Quad Pentium® Pro Processor EISA/PCI motherboard - U.S. designed & made 180/200MHz (or higher) 1/2/4 processors supported, easy processor upgrade thru CPU based board approach, 1GB memory max onboard with 168pin slots, 4 way interleave structure for max performance ECC supported, 168Pin DIMM supported, Intel 82450GX chipset, AMI Green Flash BIOS, 6 PCI + 4 EISA slots, integrated I/O w/ 1P/2S/FD/2 PCI IDEs/PS2 mouse
- Genuine Intel Pentium® Pro Processor(s) w/ Cooling Fan(s)
- 64MB=32MBx2 168Pin 4Mx72 EDO ECC Buffered DIMM
- 1.44MB Floppy Drive
- Toshiba XM-5702 TwelveSpeed IDE 1800KB/S CD-ROM
- Mylex DAC960PU/1 RAID-5 Ultra-Wide SCSI-3 PCI Controller with 8MB parity cache memory for speedy performance
- Five 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HDs
- Trident 9680 PCI 1MB MPEG+AVI Video Card
- 14" ShamRock 1Kx768NI Pwr-Saving Monitor
- Heavy-Duty Server Case Model LT-18 supporting 11 drive bays, 26"x10"x25", removable front & side doors, Lockable front door for security, "snap-in" drive mounts, swing-out feet
- 600W PC Power & Cooling AT Size Power Supply special-designed for AMI Goliath 12V/5V/3.3V
- KeyTronic 104 Key Win95 PS/2 Keyboard
- MicroSoft Ergonomic Serial Mouse w/ Pad
- [illegible]

P6⁴ is here!

ULTRA WIDE
40MB/S Ready!!!

Intel Pentium® Pro

Dual 200MHz 256/512k
$9575/$10745

Quad 200MHz 256/512k
$11945/$14285

LOOKING FOR YOUR DREAM MACHINE AT THE CHEAPEST PRICE? SHOPPING FOR A PC IN THIS RAZOR-THIN-PROFIT INDUSTRY IS DANGEROUS BECAUSE 70% OF THE DEALERS WON'T LIVE TILL THE FOURTH YEAR IN BUSINESS, MOST SELL 3 OR 4 MACHINES A WEEK WITHOUT KNOWING WHAT THEY ARE SELLING AND 99% DON'T WANT TO SEE ANY MACHINE COMING BACK AFTER YOU WALK OUT OF THE DOOR. AT UMIRACLE, WE BUILD HUNDREDS OF PC'S EVERY WEEK, WE TEST EVERY POSSIBLE COMBINATIONS OF SOFTWARE AND HARDWARE FOR COMPATIBILITY, AND WE STAND BEHIND YOUR PC'S LIFETIME LONG! WHY? BECAUSE WE LOVE YOUR PC AS MUCH AS YOU DO! COME BY AND VISIT ONE OF OUR STORES AND YOU WILL FIND OUT WHY YOU WILL BE THE WINNER!

Tahoe II Pentium II

- TYAN Tahoe-2 ATX S1682D Dual Pentium II 233-300 MHz System Board - 5 PCI + 3 ISA Slots, 8 72Pin SIMM for Max 512MB, Onbrd Super IO/FD/IDEs/USBs/PS2, Flash Award BIOS
- Intel Pentium® II CPU(s) w/ Cooling Fan(s)
- 32MB=16MBx2 60ns 72Pin EDO SIMM RAM
- 1.44MB Floppy Drive
- Adaptec 2940U Fast PCI Ultra SCSI-2 Controller
- Three 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HDs
- Toshiba XM-5702 TwelveSpeed IDE 1800KB/S CD-ROM
- Trident 9680 PCI 1MB MPEG+AVI Video Card
- 14" ShamRock 1Kx768NI Pwr-Saving Monitor
- GigaStar ATX style Medium Tower 235W ATX PS
- KeyTronic 104 Key Win95 PS/2 Keyboard
- MicroSoft Ergonomic Serial Mouse w/ Pad
- [illegible] Server [illegible]
  + Manual [illegible]

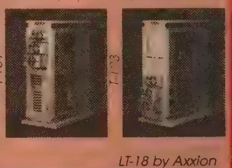
Single Pentium II	
233MHz	$3148
266MHz	$3281

Dual Pentium II	
233MHz	$3869
266MHz	$4134

NT ENHANCEMENTS

NT Guaranteed: All hardware [illegible] NT V4.0 compatible. We will install [illegible]

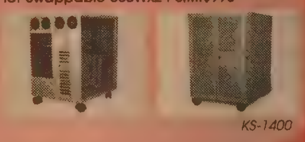
- ■ **Memory**
  - *16/32/64/128MB 10ns SDRAM UnBuffered 168Pin DIMM for 430VX/TX* .... $Call
  - *16/32/64/128MB 60ns DRAM ECC EDO Buffered 168Pin DIMM for 440FX* .... $Call
- ■ **RAID 5 Fast Ultra Wide SCSI-2 Host Adapter (for RAID-5 implementation, an IDE HD as boot drive is recommended)**
  - *DPT SmartCache IV SCSI Adapter & RAID Series/SmartRAID IV RAID Series* .... $Call
  - *Mylex DAC960 Series Hi-Performance PCI RAID Controller with upto 3 UW SCSI channels supporting 45 HDs, upto 64MB Cache installable* .... $Call
  - *AMI Complete MegaRAID Solution including:SCSI RAID level 0,1,3,5,10,30, and 50 PCI Disk Array Controllers/FlexRAID/Advanced Management Software/Advanced Enclosure Management/Boot-Up Configuration/Power Console/General Alert* .... $Call
- ■ **TapeDrive - HP DAT DDS/DDS-2 Drive (Sold & integrated with system only)**
  - *HP DAT C1534 DDS DAT Tape Drive (2GB on 90m Tape)* $540
  - *HP DAT C1536 DDS DAT Tape Drive w/DCLZ Hardware Compression (4GB on 90m Tape with compression)* $620
  - *HP DAT C1599A DDS-2 DAT Tape Drive w/DCLZ Hardware Compression (8GB on DDS-2 format with compression)* $840
  - *HP DAT C1553A DDS-2 Autoloader w/DCLZ Hardware Compression (48GB on DDS-2 format with compression)* $2080
  - *Seagate 32GB DAT DDS-2 Autoloader 4586NP (4 DAT Tape Support)* $1250
  - *Optional 12 Tape Magazine for above 4586NP upto 96GB (no tape)* $135
- ■ **High End Video Card - 3D Rendering/Graphic Animation/OpenGL**
  - *Symmetric GLyder MAX/TX-16/TX-40/MP-40 3D Accelerator* .... $520/$1790/$2245/$2520
  - *Dynamic Pictures OpenGL Accelerator Oxygen102/202/402* .... $985/$2075/$3655
- ■ **Server Chassis (T-101)/Disk Array Chassis (T-103): Dimension=13"x31"x22" w/Dual Redundancy & Hot Swappable Power Supplies** .... $880/$880
  - *T-101: 12 DriveBays/Upto 2 PowerSupply 2x300W*
    2x4.6" Smart Fans w/ Efficient Air Flow
    Full Size AT Motherboard FormFactor
  - *T-103: 16 DriveBays/Upto 2 PowerSupply 2x300W*
    2x4.6" Smart Fans w/ Efficient Air Flow
    Perfect RAID Disk-Array Sub-Chassis



- ■ **Server Chassis LT-18 By Axxion w/o Power Supply.....$480**
  - *Full-size AT, Baby AT, oversize AT based boards, 11 drive bays (one 3.5" and four 5.25" exposed, six 5.25" hidden bays), Twelve slots, "snap-in" drive rails, secondary cooling fans, accepts standard power supply.*
    Dimensions: 26" x 10" x 24.5" (DxWxH).

LT-18 by Axxion

- ■ **Server Enclosure KS-1400 w/ Dual Redundant Hot-Swappable 300Wx2 PS.....$990**
  - *Full-size AT, Baby AT, oversize AT based boards, 14 5.25" drive bays, Twelve slots, "snap-in" drive rails, 8 cooling fans,*
    Dimensions: 20.5" x 16.25" x 23.75" (DxWxH)


KS-1400

- ■ **CD-ROM Tower Subsystem Chassis**
  - *7 Plextor 20X PX-20TSI w/250W PS* $2047
  - *7 Toshiba 15X XM-3801B w/250W PS* $1468
  - *7 Toshiba 12X XM-5701B w/250W PS* $1190

Compatibility Guaranteed

Windows NT 4.0 Server/Workstation

UMiracle
UMiracle Microsystems
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Phone:510-526-2626 Fax:510-526-0273
Email: sales@albany.umiracle.com
1501 #E El Camino R, Belmont CA 94002
Phone:415-592-3333 Fax:415-592-2919
Email: sales@belmont.umiracle.com

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MasterCard

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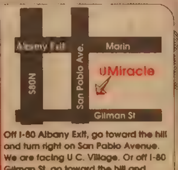
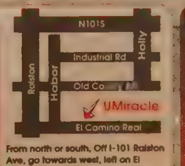
Ph:510-526-2626
1035 San Pablo Ave. #1
Albany CA 94706
[illegible]



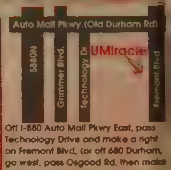
Off I-80 Albany Exit, go toward the hill and turn right on San Pablo Avenue. We are facing U C. Village. Or off I-80 Gilman St, go toward the hill and make a left turn on San Pablo Ave.

Belmont Store
Ph:415-592-3333
1501 El Camino Real #E
Belmont CA 94002
Ph 415-592-3333
[illegible]
[illegible] Open on Sunday!



From north or south, Off I-101 Ralston Ave, go towards west, left on El Camino Real and make a U-turn ASAP. We are on your right

Fremont Main
Ph:510-226-3666
44063 Fremont Blvd.
Fremont CA 94538
[illegible]
Fax:510-226-6758
[illegible]



Off I-880 Auto Mall Pkwy East, pass Technology Drive and make a right on Fremont Blvd. (or off 680 Durham, go west, pass Osgood Rd, then make a left on Fremont Blvd.) first driveway on your right

REAL STUFF, REAL QUALITY, REAL PRICES

Motherboards without CPU (Call for CPU Prices)

86 PCI 256K w/ E-IDE, FD HiSpd I/O, 3 PCI+4 ISA slots, support 72Pin SIMM	[illegible]
A-BIT Jumperless 512K Motheroboard Pentium 75-200Mhz/Cyrix® 686-200+/AMD K5/K6 supported, 2 DIMM+4 SIMM slots, PCI AT-form factor, 430VX chpst, 4 PCI+3 ISA slots, onbrd PCI-IDE, HiSpd I/O, FD, Flash BIOS	$115
ASUS TX97 Pentium® processor-based board - 430TX PCISet, Pipelined 512K onbrd, 75-200Mhz Pentium/MMX/AMD/Cyrix200+ CPUs, 4 PCI+4 ISA+1 ASUS MediaBus slots, 168Pin DIMMx3 support, onbrd Ultra-IDE, FD, HiSpd I/O, Flash Award BIOS w/NCR SCSI Suppt, AT form factor	$156
ASUS TX97-E same as TX97, plus 72PinSIMMx4 support	$160
ASUS TX97-X Pentium® processor-based board - 430TX PCISet, Pipelined 512K onbrd, 75-200Mhz Pentium/MMX/AMD/Cyrix200+ CPUs, 4 PCI+4 ISA slots, 168Pin DIMMx3 support, CreativeLabs VIBRA PnP Audio, onbrd Ultra-IDE, FD, HiSpd I/O, USB, Flash Award BIOS w/NCR SCSI Suppt, ATX form factor	$197
ASUS TX97-XE same as TX97X, plus 72PinSIMMx4 support	$197
ASUS KN97-X Pentium II processor-based board - 233-266MHz Supported, 440FX Chpst, 3 ISA+5 PCI Slots, 512K Cache on Pentium II CPU Cartridge, 1 DIMM+4 SIMM Slots, Onboard Super I/O/FD/IDEs/USBs, PnP Audio w/ Creative Labs Vibra 3D, ATX form, Award BIOS	$320
ntel Tucson TC430HX Pentium® processor-based Board - 430HX PCISet, Pipelined 512K onbrd, 75Mhz & up MMX CPU support, 4 PCI+3 ISA slots, 72Pin SIMM support upto 128MB, onbrd PCI-IDE, FD, HiSpd I/O, USB, Flash AMI BIOS, Built-in Yamaha OPL3 FM Synthesizer stereo sound w/line-in/out, Joystick, WaveTable connector, ATX form factor	$170
ntel Venus Performance/VS Pentium® Pro processor based motherboard - 440FX chpst, 150/180/200Mhz/future CPU support, 3 ISA+4 PCI slots, onbrd PCI-IDE, FD, HiSpd I/O, PS/2 mouse + kybrd connectors, Flash AMI BIOS, 72Pin SIMM support upto 256MB, ATX form factor	$150
ntel Providence PR440FX Dual Pentium® Pro processor-based board - Intel 440FX PCISet, support Dual Pentium® Pro CPUs w/VRM, ECC EDO buffered 168Pin DIMM upto 512MB, Integrated LAN Controller Intel 82557 (=EtherExpress® Pro/100B), Integrated UltraWide SCSI Adaptec® 7880 w/onbrd + External mini-68Pin Wide Connector, Integrated Audio - Crystal+Yamaha OPL3 FM Synthesizer 16bit StereoSound, 4 PCI+1 ISA slots, onbrd PCI Bus Master IDE ports, HiSpd I/O, FD, Dual ZIF Socket 8, Flash AMI PnP BIOS	$550
ntel Portland PD440FX Pentium II ATX Motherboard - Boxed version 233-266MHz Supported, 440FX Chipset 3 ISA+3 PCI Slots, 512K Cache on Pentium II CPU Cartridge, 4 72Pin SIMM Slots, Onboard Super I/O/FD/IDEs/ PnP Yamaha POL3 Integrated Audio	$320
WILL P55AVW PCI Pentium® processor-based ATX board w/ Built-in Adaptec® PCI SCSI chipset 7880 (AHA-2940UW UltraWide SCSI), Intel 430VX chpst, MMX/Cyrix 686 CPU support, 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Pipelined 512K Cache onbrd, 3 PCI+4 ISA slots, 72Pin SIMM & 168PIN DIMM, onbrd PCI-IDE ports, FD, HiSpd I/O, USB, 50Pin+68Pin Wide SCSI + FD/HD/IO cables, Musical alarm CPU fan, PS/2 mouse port & EZ-SCSI V4.0L + complete Adaptec® software driver & manual included.	$300
WILL DP6NS Dual Pentium® Pro processor-based board w/Built-in Adaptec® PCI SCSI chipset 7880 (AHA-2940UW UltraWide SCSI), 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Intel 440FX chpst, 150-233Mhz, 3 PCI+4 ISA slots, 72Pin SIMM support upto 512MB, onbrd PCI-IDE ports, FD, HiSpd I/O, 50Pin SCSI + 68Pin Wide SCSI + FD/HD/IO cables, PS/2 mouse port & EZ-SCSI V4.0L + complete Adaptec® software driver & manual	$530
Adaptec ARO1130 RAID-5 Option Card for IWILL P55TU, P55AVW or DP6NS - easily turn IWILL's 2940UW SCSI embedded motherboards to support hardware assisted RAID 0/1,0,1,5 level, 1/4MB Cache upgradeable, complete Adaptec RAID Viking software drivers supporting NT 3.51, 4.0, UNIX, Novell 3.xx, 4.xx	$320
WILL PIINS Pentium II processor-based board 233-300MHz Supported, 440FX Chipset, 4 ISA+4 PCI Slots, 512K Cache on Pentium II CPU Cartridge 8 SIMM Slots upto 1GB Onboard Super I/O/FD/IDEs/USBs, Built-in Adaptec® PCI SCSI chipset 7880 (AHA-2940UW UltraWide SCSI), 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, ATX, Award BIOS	$440
YAN Tahoe-A ATX S1684SA Pentium II 233-300 MHz System Board 4 PCI + 4 ISA Slots 6 72Pin SIMM for Max 512MB, integrated Creative Labs Vibra 16 Audio Onbrd Super IO/FD/IDEs/USBs/PS2, Flash Award BIOS (Also supports Pentium Pro CPU with optional Riser Card)	$325
YAN Tahoe-2 ATX S1682D Dual Pentium II 233-300 MHz System Board 5 PCI + 3 ISA Slots, 8 72Pin SIMM for Max 512MB, Onbrd Super IO/FD/IDEs/USBs/PS2, Flash Award BIOS (Also supports Pentium Pro CPU with optional Riser Card)	$365
AMI (American Megatrends, Inc) Goliath Quad Pentium® Pro Processor EISA/PCI motherboard - U.S. designed and made 180/200MHz (or higher) 1/2/4 processors supported, easy upgrade thru CPU based board approach, 1GB memory max onboard with 168 pin slots, 4 way Interleave for max performance, ECC support, 168Pin DIMM support, 82450GX chpst, AMI Flash BIOS, 6 PCI+4 EISA slots, integrated I/O w/ 1P/2S/FD/IDE, Full Size AT form factor	
Above w/ two 200MHz Pentium Pro 256K CPUs	$5250
Above w/ four 200MHz Pentium Pro 256K CPUs & 2nd CPU baseboard	[illegible]

CPU & Memory: (Prices Subject to Change without Notice)

ntel Pentium® Pro processor 256K/512K 150/180/200Mhz	$Call
ntel Pentium® II processor 233MHz/266MHz 512K Cache	$Call
entium® P5-100/120/133/150/166/200MHz/MMX CPU	$Call
AMD® 486-100DX4/120DX4/5x86-133DX4/K5/K6	$Call
Cyrix®/IBM® 6x86-120+/150+/166+/200+ CPU	$Call
56/512K Synchronous Pipelined Cache COAST module	$20/$30
MB/4MB 30Pin SIMM RAM	$Call
2Pin SIMM - 32/36Bit-FP/EDO/Parity	$Call
6/32/64MB 168Pin SDRAM DIMM Unbuffered 12ns for Triton VX/TX board	$Call
2/64/128MB 168Pin EDO DRAM DIMM w/ECC Buffered 60ns for PR440FX Providence/AMI Goliath motherboard	$Call

UMiracle Microsystems

[illegible]

Adaptec 2940U Fast PCI Ultra SCSI-2 Controller	$180
Adaptec 2940UW PCI Ultra WIDE SCSI-2, 40MB/s, 15 devices support	$210
Western Digital PCI-SCSI Adapter - 7193RTL Fast SCSI-2, 10MB/s, 50Pin Connection, upto 7 devices, PnP, CorelSCSI! Drivers	$85
External SCSI-2 50Pin Mini-68Pin Adapter for any onboard internal 50pin ribbon cable SCSI interface	$20
External Wide SCSI Mini-68Pin Adapter with 3-68pin-connector internal ribbon cable for any onboard internal 68pin Wide SCSI interface	$45
Fast Wide SCSI-2 internal Ribbon Cable, 68Pin, 2 / 3 connectors	$20/30
External SCSI Cables Centronic/Mini/UltraDensity 50/68Pin	$Call
External SCSI Terminator SCSI-2/Mini 50/Mini 68Pin	$Call

[illegible]

Ethernet NE2000 ISA PnP/Softset 16Bit Combo	$25
Ethernet PCI Combo (Full-Duplex, 10Base2&T) 32bit	$50
intel EtherExpress Pro 10/100 PCI ENET 32Bit 10-BT (PILA8465B)	$80
3COM Etherlink III 3C509B Combo	$85
3COM Etherlink XL 3C900 Parallel-Tasking PCI Combo	[illegible]
3COM Fast Etherlink XL 3C905-TX Parallel-Tasking 100BT PCI	[illegible]

Video

Trident 9680 Windows Accelerator PCI 1MB/2MB with MPEG and AVI Motion Video built-in	$35/45
Diamond Stealth VIDEO 2000 DRAM 2MB PCI	$80
Diamond Stealth 3D 2000XL PCI 4MB EDO-DRAM	$98
Diamond Stealth 3D 3000XL PCI 2MB/4MB VRAM	$135/$185
ATI 3D ProTurbo PC2TV SGRAM 4MB/8MB	$165/$215
Matrox MGA Millennium 2MB/4MB WRAM PCI	$155/$185
Memory module for Millennium 2MB/4MB/6MB	$95/$145/$210
Matrox MGA Mystique 2MB/4MB SGRAM	[illegible]/135

Monitors

14" ShamRock 1Kx768NIx0.28DP Digital Control Pwr-Saving Monitor	$160
15" ShamRock 1280x1KNIx0.28DP Digital Control Pwr-Saving Monitor	$240
17" ShamRock 1280x1KNIx0.28DP Digital Control Pwr-Saving Monitor	$465
Hitachi NSA SuperScan Pro CM-500U 15" .28DP, 1280x1024	$315
Hitachi NSA SuperScan Pro CM-620U 17" .28DP, 1280x1024	$525
Hitachi NSA SuperScan Pro CM-2011MU 20" .28DP, 1600x1200x66Hz	$1135
Hitachi NSA SuperScan Pro CM-800U 21" .22DP, 1600x1200x75Hz	$1355
Hitachi NSA SuperScan Elite CM-611U 17" .22DP, 1600x1280x69Hz	$695
Hitachi NSA SuperScan Elite CM-802U 21" .22DP, 1600x1280	$1790
Hitachi NSA SuperScan Elite CM-803U 21" .22DP, 1800x1440 77Hz	$1890
MAG Technitron Series Trinitron Tube, Digital Control, 0.25DP, 1280x1KNI, 3yr Manu. Warranty 15" DX15T/DX700T	$365/$655
IIYAMA VisionMaster-17 MF-8617E 17" .26DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@69Hz	$585
IIYAMA VisionMaster-Pro 17 MT-9017E 17" .25DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@72Hz, Trinitron Tube	$695
IIYAMA VisionMaster MF-8221E 21" .22x.16DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@76Hz	$1345
IIYAMA VisionMaster MT-9021E 21" .30x.00DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@76Hz, Trinitron Tube	$1395
Sony 15" 100SX/100SF	$380/$450
Sony 17" 200SX/200SF/17SE2T	$665/$745/$865
Sony 20" 300SFT/GDM20SE2T	$1605/$1850
Viewsonic E641/E655/15GA/15GS/17EA/17GA/17GS/17PS/PT770/PT775/GT770/G800/G810/PT813/G810/GT800/29GA/P810/P815	$Call
Mitsubishi, NEC, ADI, Nokia	$Call

Modem

SupraExpress 33.6K Voice Fax internal PnP	$78
USR Sportster 33.6K Faxmodem Internal/External	$120/$155
USR Sportster 33.6K Voice Faxmodem w/Voice Internal	$180
USR Sportster x2-56K Faxmodem Internal/External	$165/$195
[illegible] Sportster x2-56K Voice Faxmodem w/Voice Int./Ext	[illegible]

Floppy Drive/Tape Backup

Mitsumi/Sony/NEC 1.44M 3.5"	$24
Teac 1.2M 5.25"/1.44M 3.5"	$45/27
Colorado 3.2GB T-3000 off floppy Travan w/Win95 Sftwre, w/tape	$179
Colorado T4000S 8GB, 62MB/min, SCSI-2, Travan TR-4, internal, w/tape	$359
Tape Cartridges for Tape Backup	$Call
Iomega ZIP Drive 100MB w/disk SCSI-Internal/External	$149/$159
Iomega ZIP Drive Disks single/three/ten pack	$15/$40/$110
Iomega Jaz Drive 1GB w/disk SCSI-Internal/External	$350/$445
Iomega Jaz Drive Disks single/five pack	$100/$460
Iomega Ditto TapeBackup 2GB Insider Tavan TR-1,2,3	$145
Iomega Ditto TapeBackup 2GB Parallel External TR-1,2,3	$188
Iomega Ditto TapeBackup 3200 Insider 3.2GB Tavan QIC w/o tape	$205
Iomega Ditto TapeBackup 3200 Parallel Port 3.2GB Tavan QIC w/o tape	$255
Iomega Ditto Tape Cartridge TR-1/TR-3/TR-4	[illegible]/$45

Keyboard/Mouse/Software/Chassis/PowerSupply/Misc

Mitsumi 104 Enhanced Win95 Keyboard	$12
KeyTronic 104 Enhanced Win95 Key U.S. Made	$21
Focus 2001 104 Win95 Key Enhanced Click w/Cover	$33
Focus 6002 104 Win95 Key Enhanced w/ wristrest	$30
Natural Keyboard SK-6000 Win95 Key Enhanced	$50
Natural Keyboard SK-6000 Win95 Key Enhanced w/Touch Pad	$70
MicroSoft Natural Keyboard Win95 Key	$70
MicroSoft Ergonomic Serial/PS 2 type	$30
Logitech 2-Button Mouse Serial	$12
Logitech Mouseman Serial/PS 2 type/Cordless	$35/$45/$85
Logitech Trackman Marble	$85
MS DOS 6.22/Windows V3.11/WFWG V3.11(w/System Purchase)	$45/55/75
MS Windows 95 Full CD OEM version	$90
MS Office Professional 97 CD version	$325
MS Windows NT V4.0 Workstation	$145
MS Windows NT V4.0 Server with 5 User Access License OEM	$550
MS Windows NT V4.0 Server 20 User Access License (No Software)	$580
GigiStar Series Full Tower AT 250W/ATX 230W	$110/[illegible]
GigiStar Series Medium Tower AT 250W/ATX 230W	$85/$90
GigiStar Series Mini Tower/DeskTop AT 230W	$50/$55
Server Class Super Case w/250W PS w/ detachable front panel, Dual side door solid construction, slide-in Drive Bay, Dual fans, lots of bays, Fits Full/Baby AT Size board, Medium/Full Tower	[illegible]
Server Chassis (T-101)/Disk Array Chassis (T-103): Dimension=13"x31"x22" w/Dual Redundancy & Hot Swappable Power Supplies:	
- T-101:12 DriveBays/Upto 2 PowerSupply 2x300W, 2x4.6" Smart Fans w/ Efficient, Air Flow, Full Size AT Motherboard FormFactor	[illegible]
- T-103: 16 DriveBays/Upto 2 PowerSupply 2x300W, 2x4.6" Smart Fans w/ Efficient Air Flow, Perfect RAID Disk-Array Sub-Chassis	[illegible]
Server Chassis TL-18 By Axxion w/o Power Supply - Full-size AT, Baby AT, oversize AT based boards, 11 drive bays (one 3.5" and four 5.25" exposed, six 5.25" hidden bays), Twelve slots, "snap-in" drive rails, second cooling fans, accepts standard power supply, Dims: 26" x 10" x 24.5"	$480
Server Enclosure KS-1400 w/ Dual Redundant Hot-Swappable 300Wx2 PS, Full-size AT, Baby AT, oversize AT based boards, 14-5.25" drive bays, Twelve slots, "snap-in" drive rails, 8 cooling fans, Dims: 20.5" x 16.25" x 23.75" (DxWxH)	[illegible]
Deluxe External SCSI Case w/Terminator+SCSI Cable+P/S+Fan 3.5" Half Height/5.25" Half Height	[illegible]
Deluxe External SCSI Case w/68Pin Wide/Ultra Wide SCSI Connector + P/S + Fan 3.5" Half Height with 68Pin External Cable and Terminator	[illegible]
Power Supply PS-2 Type 230W/250W/300W	[illegible]
Power Supply ATX Type 235W/300W	[illegible]
486/P5/P6 CPU Cooling Ball-Bearing Fan w/heat sink	[illegible]
Chassis Second Cooling Fan 3" or 3.5"	[illegible]
Printer Cable 6"/10"/15"/25"	[illegible]
PS/2 mouse port connector for motherboard PS/2 mouse port	[illegible]

[illegible]

NEC CDR-4300 6x4 6X IDE 4 DISK CD-ROM CHANGER	[illegible]
NEC CDR-4400 8x4 8X IDE 4 DISK CD-ROM CHANGER	$120
Toshiba XM-5702B 12X Speed Internal ATAPI IDE CD ROM	[illegible]
Toshiba XM-6002B 16X Speed Internal ATAPI IDE CD ROM	[illegible]
Mitsumi FX800 8X Speed Internal ATAPI IDE CD-ROM	[illegible]
Mitsumi FX1200 12X Speed Internal ATAPI IDE CD-ROM	$105
Sony CDU511 16X Speed Internal ATAPI IDE CD-ROM	[illegible]
Panasonic CR585 24X Speed Internal ATAPI IDE CD-ROM	[illegible]
Toshiba XM-5701 12X Speed Internal SCSI CD ROM	[illegible]
Toshiba XM-3801B 15X Speed Internal SCSI CD ROM	[illegible]
Plextor 12-Plex 12XSpeed, 1800Kb/sec, Fast SCSI2, 105ms seek, 512K Buffer, SCAM, w/Tray, PX-12TSI internal	[illegible]
Plextor 20-Plex 12/20XSpeed, 1800-3000Kb/sec, Fast SCSI2, 95ms seek, 512K Buffer, SCAM, w/Tray, PX-20TSI internal	[illegible]
Philips CDD2600 SCSI-2 CD-ROM Writer 1MB Cache 2X record [illegible] 6X read w/SCSI Controller, Corel CD Creator 2 blank CDs Internal/External	[illegible]
Yamaha SCSI-2 CD ROM Writer CDR400tPC 512KB Cache up to 4X record & 6X read Internal [illegible] version w/Software	[illegible]

Sound Card/Speakers/MultiMedia Packages

Yamaha, Altec, Lansing Speakers	[illegible]
60W/80W/120W Hi-Fi Amplified Stereo Speakers	[illegible]
Sound Blaster Compatible 16Bit ESS Stereo w/PnP, IDE port	[illegible]
Sound Blaster 16 PnP OEM	[illegible]
Sound Blaster 32 PnP OEM	[illegible]
Sound Blaster AWE64 PnP w/ IDE Interface Retail	[illegible]
Sound Blaster AWE64 GOLD PnP w/ IDE Interface Retail	[illegible]
Audio Cable - CD-ROM to Sound Card	[illegible]

[illegible]

[illegible]

1.2GB IDE WDAC21200 - Enhanced IDE Mode-4 128KB 5200RPM	[illegible]
1.6GB IDE WDAC21600 - Enhanced IDE Mode-4 128KB 5200RPM	[illegible]
2.0GB IDE WDAC22000 - Enhanced IDE Mode-4 128KB 5200RPM	[illegible]
2.5GB IDE WDAC32500 - Enhanced IDE Mode-4 128KB 5200RPM	[illegible]
3.1GB IDE WDAC33100 - Enhanced IDE Mode-4 128KB 5200RPM	[illegible]
4.0GB IDE WDAC34000 - Enhanced IDE Mode-4 256KB 5200RPM	[illegible]
2.1GB Ultra SCSI-2 Enterprise E2170-3 512KB 7200RPM	[illegible]
2.1GB UltraWide SCSI-2 Enterprise E2170-7 512KB 7200RPM	[illegible]
4.3GB Ultra SCSI-2 Enterprise E4360-3 512KB 7200RPM	[illegible]
4.3GB UltraWide SCSI-2 Enterprise E4360-7 512KB 7200RPM	[illegible]

Quantum

2.1GB FireBall ST32160A EIDE Mode-4 10ms, 5400RPM	[illegible]
3.2GB FireBall ST33240A EIDE Mode-4 10ms, 5400RPM	[illegible]
4.3GB FireBall ST34320A EIDE Mode-4 10ms, 5400RPM	[illegible]
6.5GB FireBall ST36480A EIDE Mode-4 10ms, 5400RPM	[illegible]
2.1GB FireBall ST32160S Ultra-SCSI 10ms, 5400RPM	[illegible]
3.2GB FireBall ST33240S Ultra-SCSI 10ms, 5400RPM	[illegible]
4.3GB FireBall ST34320S Ultra-SCSI 10ms, 5400RPM	[illegible]
6.5GB FireBall ST36480S Ultra-SCSI 10ms, 5400RPM	[illegible]
4.3GB Atlas II XP34550N Ultra SCSI-2, 8ms, 7200RPM	[illegible]
4.5GB Atlas II XP34550W Ultra Wide SCSI-2, 8ms, 7200RPM	[illegible]

Seagate

2.15GB Barracuda 4LP ST32171N Ultra SCSI-2 50pin 7200RPM, 512K	[illegible]
2.15GB Barracuda 4LP ST32171W Ultra Wide SCSI-2 68pin 7200RPM, 512K	[illegible]
4.35GB Barracuda 4LP ST34371N Ultra SCSI-2 50pin 7200RPM, 512K	[illegible]
4.35GB Barracuda 4LP ST34371W Ultra Wide SCSI-2 68pin 7200RPM, 512K	[illegible]
4.55GB Cheetah AV ST34501N Ultra SCSI ST34501N 7.5/8.5MS, 10000RPM	[illegible]

MicroPolis

4.5GB TomaHawk 4LP 4345NS Ultra SCSI-2 50pin 7200RPM, 8ms, 512K	[illegible]
4.5GB TomaHawk 4LP 4345WS UltraWide SCSI-2 68pin, 7200RPM, 8ms, 512K	[illegible]
9.1GB TomaHawk9 3391NS Ultra SCSI-2 50pin, 7200RPM, 8ms, 512K	[illegible]
9.1GB TomaHawk9 3391WS Ultra Wide SCSI-2 68pin, 7200RPM, 8ms, 512K	[illegible]

Fujitsu

4.4GB M2954 UltraWide SCSI-2 68pin 7200RPM, 8ms, 506K Cache	[illegible]
9.1GB M2949 Ultra Wide SCSI-2 68pin, 7200RPM, 8ms, 506K Cache	[illegible]

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PHYSICAL CABLING SERVICE
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WAN/LAN CONNECTIVITY
INTERNET/EMAIL CONNECTION
EQUIPMENT SETUP/CUSTOMIZATION
SOFTWARE DESIGN/INSTALLATION
POWER AND DATA PROTECTION
USER/ADMINISTRATOR TRAINING
EXPERTISE TECHNICAL SUPPORT
MAINTAINENCE CONTRACT

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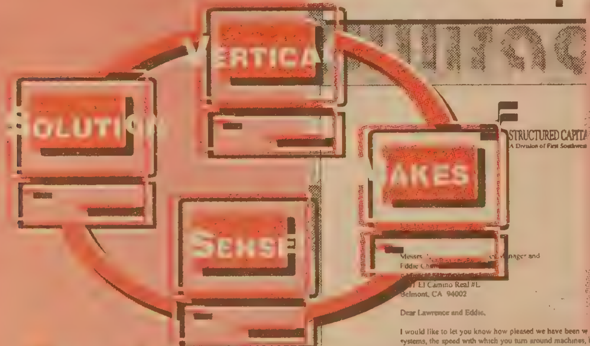

5 + PEER2PEER NETWORK SOLUTION

- FIVE ASUS TX97 AMD-K5 166MHz WorkStations w/Licensed Windows 95
- FIVE Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed
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- 10BaseT 8-Port Hub
- HP LaserJet 5 Printer
- OnSite Windows 95 Peer to Peer Network Resources and Printer Setup

Recommended Options:
- 100BaseT 8-Port Hub
- Internet Access + EMail Solution
- Network User + Administrator Training
- 3 Month 8-Hour Response Service Maintainence Contract

(See Previous Pages for Workstation Configuration Details)

\$7764 or **EQUIPMENT BUSINESSLEASE*** FOR AS LOW AS 178^{01} PER MONTH 48 MONTHS

10 + ONE NETWORK SOLUTION

- TEN ASUS TX97 AMD-K5 166MHz WorkStations w/Licensed Windows 95
- ONE Intel Venus P6 Pentium Pro 180MHz File Server w/10 User Licensed NT4.0 Server
- ELEVEN Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed
- HP LaserJet 5N WorkGroup Printer w/10BaseT Connection to Server
- 3COM 3C250 12-Port 100BaseT Stackable Hub
- APC Smart-UPS VS420 Un-interruptable Power Supply w/ Setup
- Up to 1100' Catalog5 100BaseT UTP Cabling (InWall w/ Plates - 11 Nodes)
- OnSite Windows NT WorkGroup Network Resources and Printer Setup

Recommended Options
- Internet Acces + EMail Solution
- 3 KeyStroke Recovery Backup Solution
- Fax Server Solution
- Network User + Administrator Training
- 6 Month 8-Hour Response Service Maintainence Contract

(See Previous Pages for Workstations and Server Configuration Details)

\$18728 or **EQUIPMENT BUSINESSLEASE*** FOR AS LOW AS 436^{70} PER MONTH 48 MONTHS

20 + ONE NETWORK SOLUTION

- TWENTY Intel Tucson w/Audio Pentium 166MHz WorkStations w/Licensed Windows 95
- ONE Intel Providence PentiumPro File Server w/ One PentiumPro 180MHz CPU w/25 User Licensed NT4.0 Server with Dual 100BaseT PCI NICs each connected to 100BaseT hub for double thoroughput
- TWENTY-TWO Intel EtherExpress 100BaseT PCL Network Interface Adapters Installed
- ONE HP LaserJet 5M WorkGroup Printer w/10BaseT Connection to Server
- TWO 3COM 3C250 12-Port 100BaseT Stackable Hub
- APC Smart-UPS VS650 Un-interruptable Power Supply w/ Setup
- Up to 2100' Catalog5 100BaseT UTP Cabling (InWall w/ Plates - 21 Nodes)
- OnSite Windows NT WorkGroup Network Printer and Resources Setup

Recommended Options:
- Internet Acces + EMail Solution
- 3 KeyStroke Recovery Backup Solution
- Fax Server Solution
- Network User + Administrator Training
- 6 Month 8-Hour Response Service Maintainence Contract

(See Previous Pages for Workstations and Server Configuration Details)

\$43280 or **EQUIPMENT BUSINESSLEASE*** FOR AS LOW AS 1009^{06} PER MONTH 48 MONTHS

40 + ONE NETWORK SOLUTION

- FORTY Intel Venus Pentium Pro 150MHz WorkStations w/Licensed Windows 95
- One RAID-5 Dual PentiumPro 200MHz-256K File Server w/45 User Licensed NT4.0 Server with Adaptec ANA-6940 Quad 100BaseT Port PCI Adapter for quadruple thoroughput
- FORTY Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed
- ONE HP LaserJet 5SiMX Departmental Printer w/10BaseT Connection to Server
- FOUR 3COM 3C250 12-Port 100BaseT Stackable Hubs
- APC Smart-UPS VS1000 Un-interruptable Power Supply w/ Setup
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- OnSite Windows NT WorkGroup Network Printer & Resources Setup

Recommended Options:
- Internet Acces + EMail Solution
- 3 KeyStroke Recovery Backup Solution
- Fax Server Solution
- Network User + Administrator Training
- 12 Month 8-Hour Response Service Maintainence Contract

(See Previous Pages for Workstations and Server Configuration Details)

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MULTIMEDIA 101

continued from page 224

political deal in November 1996 with the so-called Grand Alliance of broadcasters and television receiver manufacturers. In a letter from Michael J. Sherlock of NBC, acting as the chairman of the Consumer Electronics Manufacturers Association, Gary J. Shapiro, president of CICATS, and Paul E. Misener of Intel, to Federal Communications Commissioner Susan Ness, the computer industry side agreed that "neither CICATS nor its member companies nor their representatives will directly or indirectly seek to oppose or delay—before the FCC, by judicial review, legislatively or otherwise—final adoption of the positions urged by broadcasters and consumer electronics manufacturers." More crucially, from the broadcasters' financial point-of-view, the letter also stated, "Nor will they support efforts in Congress or elsewhere for auctioning of spectrum allocated or to be allocated for digital television." In return, it was agreed that "the FCC standard should include language clarifying that data broadcasting is a permitted use under the standard. Data broadcasting is defined as the transmission of any type of data other than real-time video and audio programming" and, further, that "Video and audio services may be enhanced by providing augmentation data."

> Convergence is the buzzword for this ERA OF UPHEAVAL as television, computers, and telephones MATE AND MUTATE.

In short, while appearing to detail some agreement reached, this deal actually outlines the rules of engagement and what's out-of-bounds. It sets the stage for broadcasting anarchy and a period of intense consumer confusion—although the expression used by FCC chairman Reed E. Hundt in a statement applauding his commission's acceptance of the deal right before NAB '97 is "a movement away from a command and control policy toward a market orientation for the business of digital television." This may or may not be a good thing depending on who you are, how old you are, and what you want. It certainly means that as a consumer you should avoid buying a new television, or at least spend the absolute minimum, eschewing screen size and fancy features, until the smoke of battle clears and we can identify and count the dead.

THE THRILL OF BATTLE

In the long view, the advent of digital television (DTV) is the next campaign in the long march of multimedia from esoteric high-end lab toy to ordinary everyday consumer medium. In the broad view, DTV is about breaking the 40% barrier of PC penetration into American homes and bringing the fruits of the Internet to an even wider audience. It is likely to chrysalize the old debate of viewing the interlaced TV screen from the couch about 8' or 9' feet away versus viewing the progressive-scan computer screen from a chair a couple of feet away from an academic larva to a marketplace butterfly. The question may even be whether the new breed of computer and media companies will do to traditional broadcasters what the interstate freeway system did to the railways.

Briefly, digital broadcasting can use a lot less spectrum than analog depending on size and resolution of the image. If current-quality television images were digitized, compressed and digitally transmitted they would use only one-sixth the bandwidth as they do now. The broadcasting industry liked this fact and immediately figured that TV stations could then use the leftover five-sixths of each station's allocated channel for other profitable purposes such as business data and paging, purposes more private and other than why they were originally granted the use of the public's airwaves. This, of course, did not sit well with some members of the public who felt that the spectrum should be recovered by the FCC and auctioned to the highest bidders or that TV stations should be required to use their original spectrum to improve their picture quality with such enhancements as HDTV or even to offer new consumer services made possible by digital transmission. Strangely, some of those members of the public were in the computer industry. Presumably they objected to this potential heist of the public's airwaves on principle, but there were also good business reasons for them to do so.

As Platt explains in his article, even after years of trying to come up with a new system the Grand Alliance of the broadcast industry remained conflicted over formats, standards, resolutions, and other technical and business details. The best conclusion it came up with was the non-conclusion of allowing eighteen different broadcasting standards to coexist and requiring TV manufacturers to build receivers that could deal with it! Sounds a little like the computer industry, doesn't it? And like the computer industry, there was the chicken-and-egg or killer-app problem. Who would broadcast in any enhanced format until there are receivers out there? Who will buy an expensive new TV set when there's no enhanced programming?

The most significant problem with the Grand Alliance's proposal, however, was that the eighteen standards did not include one for progressive-scan screens, the very bedrock of modern computer displays. Progressive-scan screens are the reason why computer screens look sharp and have no flicker, thus allowing one to do such basic things as read off them. The broadcast industry's omission of progressive-scan screens may have been because it's unbroken news to that industry that people read off screens, it may be that there is indeed a broadcast media conspiracy to keep the great unwashed dazzled by spectacle rather than substance, perhaps it had just never heard of convergence, but most likely it was that progressive scan cannot be compressed as much as an interlaced signal and so there wouldn't have been as much leftover bandwidth for television stations to exploit. Of course, the computer industry had to step in and begin to skirmish.

What the letter to Commissioner Ness revealed was that in return for not going straight for the broadcasting industry's jugular, its reliance on using the public airwaves at minimal cost, the computer industry would be allowed to join the DTV battle with progressive scan as its standard. On December 26, 1996, the FCC announced its concurrence with this agree-

continued on page 234

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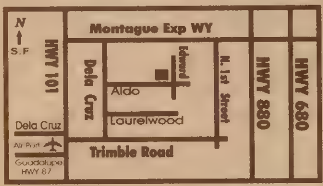

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MULTIMEDIA 101 *continued from page 231*

ment to disagree by accepting the suggested "standard" that "allows transmission of one or two High Definition Television programs; four, five or more Standard Definition Television programs at a visual quality better than the current analog signal; many CD-quality audio signals; and the delivery of large amounts of data. The standard does not include requirements with respect to scanning formats, aspect ratios and lines of resolution." On April 3, 1997, the FCC announced the allocation of spectrum for digital transmissions to broadcasters, an accelerated schedule for conversion to DTV, and even plans to recover for auction some spectrum no longer used by current broadcasters. In some ways, it's a masterpiece of compromise. In others, it's an incredible example of Orwellian Newspeak, promising all sorts of benefits to consumers without acknowledging the downside, which over the next five years or so is likely to be severe. Civilians always suffer in war.

DTV is about breaking the 40% barrier of PC penetration into American homes and bringing the fruits of the Internet to an even wider audience.

THE SPOILS OF WAR

When it comes to the conversion from analog to digital broadcasting, it may be, as is said about certain bodily functions in the weightlessness of space, that "There ain't no graceful way." Current TV sets will not pick up digital signals. Set-top converters should become available but obviously you wouldn't get the full benefits of improved picture or most extra services. Without doubt, you're going to have to invest a further fair chunk of change in your current home theater to watch digitally broadcast television. New digital TV sets will supposedly be available by Christmas 1998 with, Chairman Hundt promises, "three or four network-affiliated digital signals in the top ten markets by April 1, 1999, roughly 24 months from now, and three network-affiliated signals in the top thirty markets by November 1, 1999, roughly 30 months from now." Ten years from now, all analog broadcasting is scheduled to stop.

In the meantime, Microsoft and other members of CICATS think they have a potent weapon in the war to establish the new standard of progressive scan. That weapon is the computer industry's experience with rapid product development, frequent revision and upgrading, new market development, and free-market rough-and-tumble. The theory is that, besides new computers being ready to receive DTV signals out of the box, tuner cards will be available as add-ons to older computers. Supposedly, traditional consumer electronics companies will not be able to get product on the shelves as fast as computer companies. It's hard to take this claim seriously, but, according to *The Wall Street Journal*, Ron Whittier, an Intel vice president, predicts that by the year 2000 there will be 100 million computers able to receive DTV compared with only one million TV sets.

If that becomes the case, there will obviously be no shortage of "content providers" lining up to produce programming. However, that little old chicken-and-egg problem is still on the road between here and there. Microsoft is attempting to get around this by both producing new programming for TV, enhanced DTV and the Web, and by producing tools such as NetShow that stream multimedia over the Web and for some integration with broadcast-over-the-air programming. Intel for its part has a process called Intercast that uses the Vertical Blanking Interval between video frames to transmit data to the desktop. This works even with analog signals and cable, requiring only a TV tuner card and software costing between $99 and $150. MTV broadcasts two hours a day of Intercast programming while its second channel, M2, is already 24/7.

These are early days yet but what we're seeing is a lunge by Microsoft and Intel to grab the audience of tomorrow. Given the peculiar position that television has in American culture and family life, there are a lot of wild cards out there that haven't been addressed yet. Plenty could go wrong from any player's position. Although it seems unlikely, Microsoft's purchase of WebTV could be overturned by the Justice Department. Chairman Hundt's promise of how many stations will have made the switch to DTV by November 1, 1999 could be ludicrously optimistic. The American public could flat-out refuse to spend thousands of dollars replacing their analog sets, choosing instead to spend their viewing time endlessly watching old movies on the VHS VCR. DVD could be a hit or not. There's always the tussle over who has the remote—when the remote becomes a mouse will everyone retreat to their own private set? How does cable fit into the picture? Will cable-modems and services like @Home become significant players? What about satellites? And Microsoft has plans for over 800 of those! Ultimately, there's a question over whether tomorrow's audience will prefer the directed and limited world of professionally produced media, which by its market definition can only have so many players, or the wide-open amateur spaces revealed by such developments as 'zines, pirate radio, and the Web, which can have a virtually limitless number of producers.

I make two fearless predictions: If you're over 10 years old today, don't worry—you're not a target in this war, you're already over the hill. These developments will take a good long time to roll out whatever the FCC says. Having left the decisions to the marketplace, the war over technical standards could rage first one way and then the other almost indefinitely. The short-term battle is to determine the media habits of today's under-10s and success there will be the foundation of long-term future success. Secondly, the first truly great artistic work of interactive multimedia will be a remake of "Citizen Kane" with Bill Gates in the role originally played by Orson Welles. Oh, and a third one: This column will return to this subject. ■

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Ten years from now, all analog broadcasting is scheduled to STOP.

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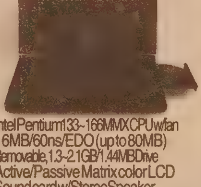

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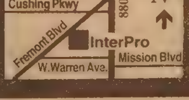
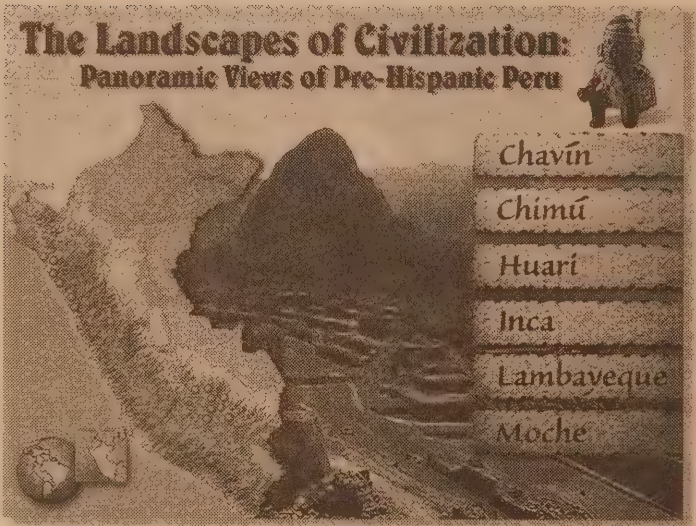


Virtual Peru

Being There In Multimedia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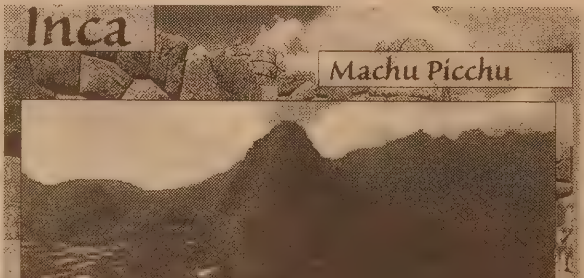

Accompanying almost every major museum show of ancient, classical and ethnic art are sponsored and guided travel tours, available for those patrons who want to experience first-hand the environments that gave birth to the world's great art.

Many more would go if only they had the time or the money for the trip. Now more museums are turning to virtual reality "travels" through the computer and the World Wide Web to let visitors enhance their experience with at least a bit of the sense of "being there."

CONTEXTUALIZATION

Museums have made great progress in "contextualization," where the objects of art are placed in the context of the communities that used them and the worlds they inhabited. Curators and designers present collateral and supportive exhibits and materials that put a human face on the cultures that created the art.

"The Spirit of Ancient Peru: Treasures from the Museo Arqueologico Rafael Larco Herrera," a show at the M.H. de Young Memorial Museum in San Francisco which runs until August 10, has done just that. It was organized by the Fine Arts Museums of San Francisco and curated by Kathleen Berrin, FAMSF curator of Art from Africa, Oceania and the Americas.

You might think that only the museums of contemporary art are risking new technologies to enhance their exhibits, but many classical museums, like the Louvre with its groundbreaking Web site, are often ahead of the pack. Just last year, here at the de Young, we saw "Virtual Pompeii," emulating the Temple of Isis and the Grand Theater. That exhibit was curated by Renee Dreyfus, curator of Ancient Art and Interpretations, and created by Carl Eugene Loeffler, with

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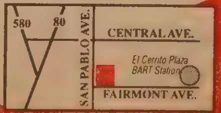

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VIRTUAL PERU *continued...*

SIMLAB at the STUDIO for Creative Inquiry at Carnegie Mellon University in Pittsburgh. This immersive exhibit was configured for an audience of about fifty, wearing Stereographics glasses viewing a 3-D projected image of the space as navigated by one person with a trackball and a head-mounted display (HMD).

VIRTUAL PERU

At "The Spirit of Ancient Peru," you'll find a very clear and capable "virtual reality tour" of fifteen Peruvian archeological sites and environments where you can click and drag on a Macintosh and everyone in the room can see the results on a wall displayed through a video projector. Instead of the more ambitious and technically "iffy" immersive theatrical VR of "Virtual Pompeii," this time the de Young went with a more "CD-ROM-like" self-guided desktop-type VR. This Peru program will be made into a CD-ROM as well.

Finding this VR facility at "The Spirit of Ancient Peru" will take some sleuthing skills, as it is buried out of sight at the far end of the Education Room past the Reading Table. The installation has a kiosk with two Macintoshes at a table, one which drives the video projector, and the other which can be independently controlled and has a monitor for its display.

Well-designed pictorial menus bring the viewers into the mapped environments of the sites that nurtured the fascinating variety of expressive pottery, fabrics and jewelry arrayed in the galleries beyond. The Chavín, Chimú, Huari, Inca, Lambayeque and Moche pre-Hispanic cultures are arrayed in a bar column. As you move the cursor over each bar, the sites of that culture are highlighted on the map of coastal Peru with pop-up name labels for each city. Click on the bar, and you are brought to that culture's menu page. There you are presented with the sites, and each site menu shows the nodes on the city map where each panoramic point of view is centered.

SPINNING AT THE TOP OF THE WORLD

Each of the fifteen panoramas is navigated by clicking and dragging the cursor on the screen. You can look all around, tilt up and down, and zoom in and out using the keyboard. The zooms are not high-resolution, so they quickly crumble, but they're effective in expanding the viewer's involvement in the site. The spectacular mountainscapes and skies framing the villages and ancient structures come through wide and clear enough to make your ears pop.

There are seventeen virtual objects in the program that allow you to do what is off-limits in the galleries; you can "handle" the artifacts. All these objects can be spun on their horizontal axes, so you can examine all the surprising details and rich character of treasures like a Double-Spouted Architectural Vessel and the gold Janus cup from Keros.

> **At "The Spirit of Ancient Peru," you'll find a very clear and capable "virtual reality tour" of fifteen Peruvian archaeological sites and environments where you can click and drag on a Macintosh and everyone in the room can see the results on a wall displayed through a video projector.**

PANORAMIC VISIONS

Dr. John W. Rick, associate professor, curator of Anthropology Collections and an archaeologist at Stanford University, had been working in Peru for three years at a site called Chavin de Huantar. He came back with about 150 photo panoramas from there, and then fifty more from other sites. Each panorama was composed from a series of a dozen 35mm photographs using Fujichrome Provia stock and shooting with a 17mm lens mounted on a Kaidan self-leveling panoramic tripod.

"I was contacted by curator Kathleen Berrin about the de Young show," says Rick, "and the right resources and expertise came together to make the virtual reality aspect part of the exhibit."

The project is a collaboration of Live Picture, the Fine Arts Museums, and Dr. Rick; it took the work of two or three people for a month and a half. Live Picture provided the funds for digital picture processing; it also donated $5,000 worth of equipment to the Museum for the kiosk and display, as well as technical support and programming. It also produced the finished presentation. Live Picture's Eric Froehlich, content designer, did the interface design.

Jonathan Ledergerber, content engineer at Live Picture, explains: "The actual presentation is running in Macromedia Director. Our Xtra for Director allows Director developers to use our RealVR technology within that environment. I did the Director programming."

The RealVR technology is the combination of panoramic image viewing with IMOBs (Image-based objects) which are very similar to QuickTime VR Object Movies. PhotoVista is Live Picture's panorama stitching program; FlashPix is an image format which allows you to bring higher resolution data and serve it over the Internet.

A LEGION OF MEDIA

As assistant to the director of the Fine Arts Museums, Dakin Hart is the point man for all of their high technology projects. He did all the actual linking of the panoramas and the Peru program itself.

He is also responsible for the Web site, where you will find information and visuals of the Peru exhibit as well as "Art of the Americas: Cultural Crosscurrents Virtual Gallery." This page, found

continued on page 268

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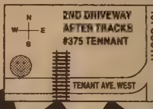

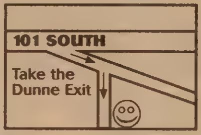

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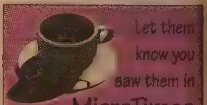

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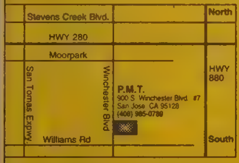

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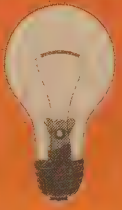

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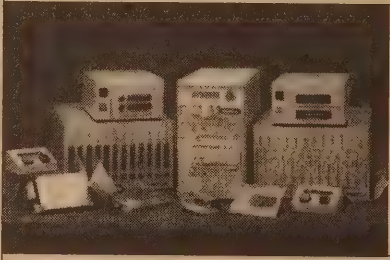

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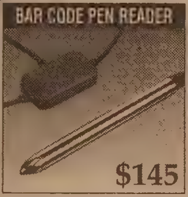

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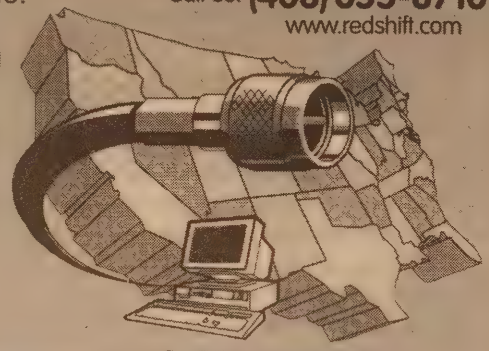

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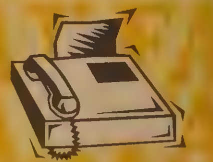

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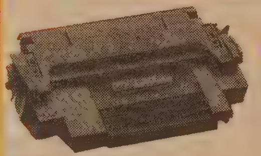

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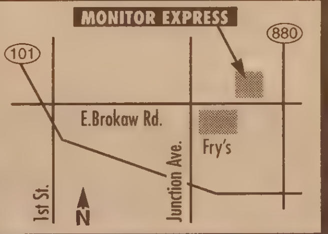

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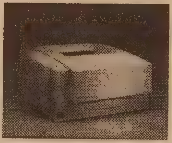

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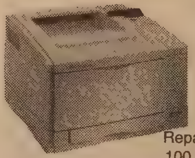

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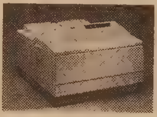

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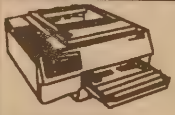

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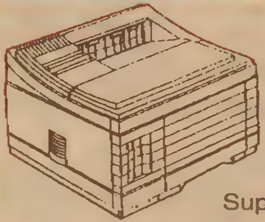

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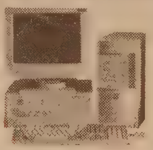

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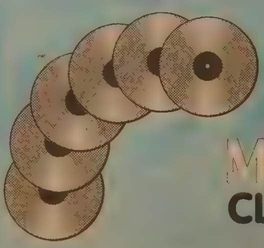

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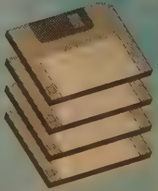

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Resources

Calendar Of Events

Conferences, Shows, Special Events

June

June 21 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

June 21 Computer Show. Santa Clara Fairgrounds. Contact: (415)493-8209 or URL: *http://www.inetbiz.com/pam* .

June 23–27 ATM Year '97. San Jose. Contact: 1-800-200-4884 or URL: *http://www.tticom.com/atmyear97* .

June 25–27 Software Testing and Quality Assurance. San Francisco. UC Berkeley Extension. Contact: (510)643-1492.

June 26–28 MacHack Conference. Dearborn, MI. Contact: URL: *http://www.machack.com/97/* .

June 27 Northern California Computer Show. Sacramento. Contact: (707)455-7191.

June 30–July 1 Enterprise Outlook. Burlingame. Contact: (212)343-1900, or URL: *http://www.tpsite.com* .

June 30–July 2 Potlatch National Educational Computing Conference (NECC) '97. Seattle, WA. Contact: 1-800-280-6218, *necc97@wce.wwu.edu* , or URL: *http://www.wce.wwu.edu/necc97* .

July

July 5 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

July 6 Livermore Amateur Radio Klub (LARK) Swap Meet. Las Positas College, Livermore. LARK. Contact: (510)783-2803, or (510)447-3857 (eves.).

July 12 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

July 22–23 Intranets–Design and Implementation. San Francisco. American Research Group. Contact: (919)461-8600, or URL: *http://www.arg.com* .

July 26 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

July 31–August 1 Automated Software Testing. San Francisco. UC Berkeley Extension. Contact: (510)643-1492, *bnw@unx.berkeley.edu* .

August

August 2 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

August 3 Livermore Amateur Radio Klub (LARK) Swap Meet. Las Positas College, Livermore. LARK. Contact: (510)783-2803, or (510)447-3857 (eves.).

August 16 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

August 20–22 The Third Annual Utility Industry Handheld and PDA Forum '97. St. Louis, MO. World Market Strategies. Contact: (415)252-8008, *info@wmsltd.com* , or URL: *http://www.pda-expo.com* .

August 20–23 ISPCON '97 (Internet Service Provider Convention). San Francisco. Contact: 1-800-933-6038, or URL: *http://www.ispcon.com* .

August 23 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

August 25–28 Java Internet Business Expo. New York, NY. Contact: (415)578-6900, or URL: *http://www.sbforums.com* .

September

September 6 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

September 7 Livermore Amateur Radio Klub (LARK) Swap Meet. Las Positas College, Livermore. LARK. Contact: (510)783-2803, or (510)447-3857 (eves.).

September 8–11 Electronic Commerce World. Philadelphia, PA. Contact: 1-800-336-4887.

September 8–9 Internet Outlook. Burlingame. Contact: (212)343-1900, or URL: *http://www.tpsite.com* .

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JUNE 23

BMW CyberDrive

INTERNET

A joint Internet effort from Apple Computer, Inc., and BMW of North America, Inc., BMW CyberDrive begins on June 23 and will allow computer users to experience some of the world's greatest wonders via their Web browsers and possibly win valuable prizes at the same time. The BMW CyberDrive will provide "test drives" through twenty-one Internet destinations such as a journey on the Trans-Siberian railroad, a Napa Valley balloon ride, a roll over some of the world's greatest roller-coasters and even the opportunity to design a golf course. Powered by Apple technology, the twenty-one Web sites will feature movies, animation, and innovative games and activities. Participants can also search for prizes such as an Apple eMate 300, an Apple MessagePad 2000, an Apple Power Macintosh 6500 Creative Studio, or the grand prize of a one-year lease of a BMW Z3 roadster plus an Apple Twentieth Anniversary Macintosh. The BMW CyberDrive will be online for four weeks. To participate or to learn more, contact *http://www.bmwusa.com* .

Bay Area Video Coalition (BAVC) Workshops and Seminars

SAN FRANCISCO

The Bay Area Video Coalition (BAVC) will be conducting a new schedule of workshops and seminars in the areas of video and multimedia production and post-production. From basic video production classes to advanced engineering classes taught with broadcast-level equipment, BAVC's education program offers a range of workshops at all skill levels. BAVC's new 11,000 square foot facility has expanded to also include a new slate of Internet and Multimedia classes. June courses include: Digital Audio Editing with ProTools; Advanced Adobe After Effects; Creating a Web Site; Authoring with Macromedia Director; and Intro to Video Engineering. For a complete list of workshops, please contact BAVC at (415)861-3282, *Videonet @aol.com* , or URL: *http://www.bavc.org* .

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16X EIDE	$88
PANASONIC	
12X EIDE	$78
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TOSHIBA	
12X EIDE XM-5702B	$78
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15.7X SCSI XM-5901B-S	$199
MITSUMI	
8X EIDE	$68
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SANYO	
20X EIDE	$128

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CDD 2010/20 4X Read, 2X Write Ext	$699
CDD 2600/12 6X Read, 2X Write Int	$699
CDD 2600/20 6X Read, 2X Write Ext	$799
YAMAHA (Retail)	
CDR-400 6X Read 4X Write Int.	$699
CDR-400 6X Read 4X Write Ext.	$829
Adaptec CDR Easy CD Pro (Win 95/NT/Win 3.11)	$150
Adaptec CD-Creator (Win 95/NT/Win 3.11)	$169
Adaptec CD-Creator for Mac	$175
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Sound Blaster 64 AWE PnP	$138
Sound Blaster 64 AWE + Gold	$175
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ACS51	$59
ACS52	$79
ACS53 27 Watt Speaker w/Subwoofer	$125
ACS500 5 Channel 3pcs Sound Systems	$299
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M15 Speaker	$78
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System 45 w/subwoofer	$169
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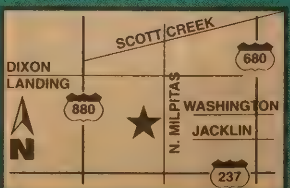

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- Deluxe Medium Tower
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- Serial Mouse w/Pad

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Diamond Stealth 3D 2000 w/4MB EDO	$82
ATI 3D Pro Turbo PC2TV w/8MB SGRAM	$168
Matrox Millennium 4MB WRAM (Retail)	$168
Intel "Venus" Pentium® Pro M/B	$148
Quantum 4.3GB EIDE Hard Drive	$238
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SONY

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21" PT813 1600x1280 .28dp	$1428
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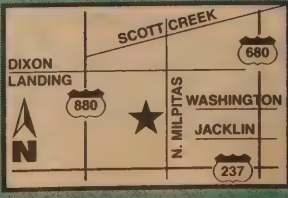

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Calendar Of Events *continued...*

Classes, Seminars, Workshops

June

June 19 Intermediate Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 20 Cruising the Internet. San Jose. Computerific! Contact: (408)295-6042.

June 20 Introduction to WordPerfect for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 20 Introduction to Java. San Francisco. The Learning Annex. Contact: (415)788-5500.

June 21 Introduction to Macintosh. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

June 21 Introduction to Netscape Communicator. San Francisco. The Learning Annex. Contact: (415)788-5500.

June 21 Intro to Windows 95. San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/*.

June 21 Intro to Video Engineering. San Francisco. Bay Area Video Coalition. Contact: (415)861-3282, *videonet@aol.com*, or URL: *http://www.bavc.org*.

June 21–22 Creating a Web Site. San Francisco. Bay Area Video Coalition. Contact: (415)861-3282, *videonet@aol.com*, or URL: *http://www. bavc.org*.

June 23 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

June 23 Intermediate WordPerfect for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 23–26 Mechanical Desktop Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

June 23–27 Core Technologies of Microsoft Exchange Server 5.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com*.

June 23–29 Supporting Windows NT 4.0–Core Technologies. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com*.

June 24 FileMaker Pro 3. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 24 Photoshop 4 and 3. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 24 Business and the Internet. San Francisco. San Francisco Business Computers. Contact: (415)788-5338.

June 24 Introduction to Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 25 QuarkXPress 3. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 25 Intermediate Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 26 Goldmine. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 26 Publisher 97. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 26 Illustrator for the Mac. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 26 Pagemaker 6. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 26 Dragon NaturallySpeaking Workshop. San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/*.

June 26–27 Photoshop Advanced. San Francisco. Photo Metro Digital Workshops. Contact: (415)243-9917, *jo@idiom.com*, or URL: *http://www.photometro.com*.

June 27 Schedule +. San Jose. Computer Training Consultants. Contact: (408)241-3200.

June 27 Introduction to Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 28 Introduction to Painter. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

June 28 How to Design a Web Page Using HTML. San Francisco. The Learning Annex. Contact: (415)788-5500.

June 28–29 Authoring with Macromedia Director. San Francisco. Bay Area Video Coalition. Contact: (415)861-3282, *videonet@aol.com*, or URL: *http://www.bavc.org*.

June 30 Director II: Custom Handlers. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

June 30 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

June 30 Intermediate Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

June 30–July 2 Administering Microsoft Windows NT 4.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com*.

June 30–July 3 Installing and Supporting Microsoft Office 97. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com*.

July

July 1 PowerPoint Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 1–2 AutoCAD R14 Update Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

July 2 Introduction to WordPerfect for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 7 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

July 7 Intermediate WordPerfect for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 7–10 AutoCAD R13 Level I Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

July 7–13 Core Technologies of Microsoft Exchange Server 5.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com*.

July 7–31 Speech Recognition Beginning to Advanced Classes. San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/*.

July 8 Introduction to Illustrator. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

July 8 Introduction to Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 8–12 Administering Microsoft Windows NT 4.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com*.

July 9 New-to-Computer User Course for Speech Recognition (Certified). San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/*.

July 9 Introduction to Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 12 Introduction to Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

July 14 Intermediate Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 14 Intro to Windows 95. San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/*.

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Pentium®-200MMX w/CPU	629
Pentium® Pro 180 PCI w/CPU	609
Pentium® Pro 200 PCI w/CPU	699

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US Robotics 33.6 PCMCIA	249
Zoltix 33.6 Int Fax Modem	80

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Iomega 1GB Jaz Drive Ext	399

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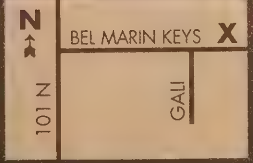

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Calendar Of Events

continued from page 254

July 14–17 AutoCAD R13 Level II Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

July 14–18 Internetworking with TCP/IP on Windows NT 4.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 14–20 Supporting Windows NT Server 4.0 – Enterprise Tech. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 15 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

July 16 New-to-Computer User Course (certified) for Speech Recognition. San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

July 21 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

July 21 Introduction to Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 21–24 AutoCAD R13 3-D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

July 21–25 Supporting Windows NT Server 4.0 – Enterprise Tech. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 21–25 Accelerated Training for Windows NT 4.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 22 Intermediate Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 23 Introduction to Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 24 Introduction to PowerPoint for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 24–August 14 Photoshop for the Web. San Francisco. Computer Arts Institute. Contact: (415)546-5242 , *cai@sirius.com* , or URL: *http://www.sirius.com/~cai* .

July 24–August 14 Photoshop for the Web. San Francisco. Computer Arts Institute. Contact: (415)546-5242 , *cai@sirius.com* , or URL: *http://www.sirius.com/~cai* .

July 25 Introduction to WordPerfect for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 26 Intermediate Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

July 26 Intro to Windows 95. San Mateo. Zephyr Business Services. Contact: (415) 655-2405, or URL: *http:// members.aol.com/zephyrbus/web/* .

July 28 Director III: Shockwave. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

July 28 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

July 28–August 1 Core Technologies of Microsoft Exchange Server 5.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 28–August 3 Internetworking with TCP/IP on Windows NT 4.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 29 Intermediate Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

July 29–August 2 Administering Microsoft Windows NT 4.0. Fremont. Unitek. Contact: 1-800-454-7212, or *training@unitek.com* .

July 30 Intermediate WordPerfect for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

August

August 2 Intro To Macintosh Class. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

August 4 Free Microsoft Exchange Presentation. San Jose. Contact: (408) 281-5818.

August 4–29 Speech Recognition: Beginning Through Advanced Classes. San Mateo. Zephyr Business Services. Contact: (415)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

August 7–8 PCB Design for EMC Compliance Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

August 9 Introduction to Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

August 11 Introduction to HTML. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

August 11 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

August 14–16 Printed Circuits Components, Fabrication, and Assembly Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838.

August 18 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

August 23 Advanced Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

August 25 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

August 30 Macintosh Graphics Extravaganza. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

September

September 1 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

September 6 Introduction to Painter. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

September 8 Director I: Introduction. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

September 8 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

September 13 Introduction to Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

September 15 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

September 20 Advanced Illustrator. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*

September 29 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818. ■

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User Group Network

BULLETIN BOARDS

MULTIZONE

BayBytes BBS. Multizone (408)327-2095; (415)327-2095; (510)739-3045; baybytes.com . 24 hrs., 33,600. Web, Internet, email, chat, Telnet, FTP, IRC. Files, game areas. Come MUD with us! Mostly friendly people, free trial period. [Exp. #166.]

Kewl! BBS. Multizone (415)592-8520, 856-2320; (408)735-1822. 24 hrs., 2400–28,800. Games, chat, files, MajorNet forums, MajorMud Interlink Conference, WorldGroup. Free trial. [Exp. #167.]

Escape To Other Worlds BBS. (408)956-1745. 28,800. Four lines. Online matchmaking, chat, games. [Exp. #167.]

408

Gold Coast Online. (408) 278-8461. 24 hrs., Full Internet, 80 lines, adult chat, discussion, files, Matchmaker, community services, ladies free. Free trial. [Exp. #167.]

Mariposa BBS. (408)847-8507. 19.2Kbps max. Education software, games, graphics, adult. [Exp. #167.]

Matrix Online RPG BBS. (408)260-7989. RPG gaming and SciFi Fandom BBS. BRE/FE League Play. Internet email. FidoNet, GuildeNet, MeGAnet, Usenet gaming topics. File distribution service. Sysop: Gryphon. [Exp. #166.]

The Holodeck BBS. (408) 261-1313, 935-9366. Online chat (21 lines), real-time interactive games, SOC, LOC, Game Connection, Internet email, Telnet, IRC. Direct dial or Telnet to WWCOMM.COM . [Exp. #166.]

The Wave BBS. (408)477-1186, 353-4354. 23 hrs., 28,800. Adult chat, games, WorldGroup, files, free demo accounts, monthly membership. [Exp. #168.]

415

Bay Windows BBS. (415)871-0359. 24 hrs. DOS, Windows, games, utilities; online doors, echo mail available. User-friendly GT Power v19 RIP compatible. URL: *http://www.sirius.com/~jlo* . Sysop: Judy. [Exp. #167.]

Flying High BBS. (415) 467-2303. 24 hrs., 14,400–28,800. Gay/straight Asian XXX, games, L.O.R.D., Call back verification required for new users. Free. [Exp. #167.]

GameWorld BBS. (415) 493-0607. Lots of games to download, free, 15 doors, friendly sysop. [Exp. #168.]

Golden Gate Computer Society BBS. (415)457-2516. 24 hrs., 33,600. Four lines, 2GB/files, 30 min./day free. ILink, Cal.Link, Usenet, Internet email: $24/year. [Exp. #167.]

TLC Net Server. (415) 826-2116. 8-N-1, 24 hrs., Internet, email, chat, Telnet, FTP, IRC, PPP, POP3, 60+DOORS. FREE Trial Period! [Exp. #166.]

510

Aaron Construction Company BBS. (510)521-0281. 8-N-1, 24 hrs., 2400–28,800. Construction and Second Amendment oriented. Free. [Exp. #167.]

Dr Jack's Thing. (510) 689-4022. 42,000 adult files. Huge Midi-Wav collection. Special offer for the ladies. [Exp. #168.]

Gold Diggers BBS. (510)568-7807,,,25,25. 24 hrs., 2400–28,800. RIP SLBBS 5.0, v32bis, files, CD-ROM, online games, messages, all CPUs welcome. $10/year. Sysop: Harry Goldberg. [Exp. #166.]

Hypoxia BBS. (510)353-1310, 651-7328, 651-3876; URL: *http://www.geocities.com/SiliconValley/6056* .7 A First Class BBS for all the people out there who are fed up with conforming. Sysop: Lord Lief. [Exp. #166.]

K 3 & Company. (510) 370-3719. 2400–56,600. Job openings from Bay Area companies. Resume tips and templates. [Exp. #167.]

KanonTech BBS. (510) 235-6839. Martial Arts , programming, online games, 2 lines, writers/artists conferences. MOD/Midi music section. Free. Sysop: Kanon Kubose. [Exp. #166.]

MaDDog Sports BBS. (510)895-8089, 483-0203. 24 hrs., 2400– 28,800. CD-ROMs, online games, FidoNet, free Internet email, Raiders, 49ers, and other team's echoes from the Internet. Lots of sports, new files daily. Sysop: Troy Earp. [Exp. #167.]

Mike's Mess BBS. (510) 753-5869, or URL: *http://home.earthlink.net/~mikeam* . 8-N-1, 24 hrs., 33,600. Internet email, user groups, onliners, files. Free access. [Exp. #168.]

Red Dwarf BBS. (510)261-3966. 24 hrs., Wildnet, MSI SupportNet, online games, files, messages, doors. SciFi/RPG-based, but we offer more. All welcome. Sysop: Earl Williams. [Exp. #168.]

VisionBytes! (510)355-0968. 28,800. Health care, computer/software, kids newsgroups. ASP, Apogee, Epic, 16 CDs, Internet email. Free!! [Exp. #166.]

Windows OnLine. (510) 736-8343, Telnet: WOLLY.WOLNET.COM , URL: *http://www.wolnet.com* . 8-N-1, 24 hrs., 33,600. Largest Windows BBS. Free limited trial. [Exp. #167.]

707

Multi_Server BBS. (707) 648-2007. Full Internet access, games, doors, TW2002 multi-player. Tarot, Matchmaker, 6GB files. Free trial offer, special introductory rate. [Exp. #166.]

Is Your Listing Missing?

Free user group and association listings are limited to the group's name, meeting information, contact name and phone number, and a ten-word description. They will be **deleted at six-month intervals** to ensure timeliness and accuracy of information.

Free BBS listings are limited to the board's name, phone number, hours, baud rates, parameters, and a ten-word description. Please let our readers know if your BBS is free or requires a fee. Because we have an ongoing problem of boards shutting down without telling us, much to the annoyance of would-be callers and the new phone number's owner alike, we will **delete these listings after they've run three months.** The notice at the end of the listing—Exp. #xxx—refers to the last issue number it will appear in unless renewed.

You can update or renew your listings at any time. If yours is missing, send your listing information to:
US Mail should go to: MicroTimes User Group, 3470 Buskirk Ave., Pleasant Hill, CA 94523. **Faxes** are welcome at (510)934-0883.
Email can be sent to: *cassidy.allen@microtimes.com* or MCI:MICROTIMES.

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** Figures based on data compiled through an independent reader survey, conducted by Research USA, Inc., May 1995.*

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Please use separate forms for multiple store locations

Store Name: ____________________
Store Manager: ____________________
Address: ____________________
City: ____________ **State:** ______ **Zip:** ____________
Phone: ____________ **Fax:** ____________
email: ____________ **URL:** ____________

What is your specialty?
Stores:

☐ CD titles
☐ Computer hardware
☐ Desktop publishing
☐ Entertainment
☐ Mobile office
☐ Multimedia
☐ Networking
☐ Notebooks
☐ Peripherals
☐ Repairs
☐ Service bureau
☐ Small office/Home office
☐ Software
☐ Software development
☐ Training
☐ Video
☐ **Internet provider:**
  ☐ Business services
  ☐ Co-location
  ☐ High-speed access
  ☐ Web page development

List your top 2 specialties and in-house expert for each:

Specialty	Expert
1. ____________	____________
2. ____________	____________

What software operating systems does your business support?

☐ Windows NT ☐ Windows 3.X ☐ Windows 95 ☐ MS-DOS ☐ UNIX ☐ Macintosh ☐ Novell ☐ OS/2 ☐ Other

What special value-added services (e.g., service, training, support, warranties, return policy, etc.) does your business offer? *(Please keep responses under 25 words or we will edit them to fit available space.)*

____
____
____

Are you a vendor-authorized sales, service, training, and/or support source?
If so, please list up to three vendors (e.g., Apple, IBM, Novell, Hewlett-Packard, Compaq) who have authorized your business to provide these services, and check the areas for which you're authorized.

Vendor	Sales	Service	Support	Training
1. ____________	☐	☐	☐	☐
2. ____________	☐	☐	☐	☐
3. ____________	☐	☐	☐	☐

I certify that all the statements made in this survey are true.

Name: ____________ **Signature:** ____________
Title: ____________ **Date:** ____________

continued from page 256

USER GROUPS

AMIGA

AWEST–Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415) 441-1120. [Exp.#166.]

RE-Amiga—Redwood Empire Amiga Users Group. Meetings: 3rd Sun., 6:00 pm, 2749 Guerneville Rd., Santa Rosa. Call: Jackie, (707)571-8474, or mail P.O. Box 7578, Santa Rosa, CA 95407. [Exp.#166.]

TOGA–The Other Group Of Amigoids. Meetings: 4th Sat., 12:30 pm, Milpitas Community Library Meeting Room, 40 N. Milpitas Blvd., Milpitas. An informal group to share ideas, PD software, and information. Free. Contact: Randy Abel, (408)356-9405 or *rabel1@dsp.com* ; or Warren Burnham, (408) 252-3406 or *wburn46506@aol.com* . [Exp.#166.]

ATARI

ABACUS–Atari Bay Area Computer Users Society. Meetings: 1st Sat., 1:00 pm, Potrero Branch Public Library, 2nd floor, 1616 20th St., San Francisco. Supporting all Atari computers and video games systems. Call: Roger Sinasohn, (415)469-7924, BBS (415)564-8062. [Exp.#166.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Main Library, Estudillo Room, 300 Estudillo Ave. Call: Robbie, (510)797-5636. [Exp.#170.]

COMMODORE

CHUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park Clubhouse, Hayward. Commodore 64 and 128 owners are welcome to attend. Call: (510)793-7868. [Exp.#171.]

CWEST–Commodore 64/128 Users In SF. 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission (near Ocean), San Francisco. Call: (415)441-1120. [Exp.#166.]

Diablo Valley Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm, Clayton Valley Presbyterian Church, 1748 Kirker Pass Rd., Clayton. Call: (510) 689-3224. [Exp.#168.]

IBM AND COMPATIBLES

AT&T Computer Users Group. Meetings: 1st Wed., 7:00 pm, 50 Fremont St., 40th Floor (near 1st and Mission), San Francisco. Demon-strations, technical support, informal discussion. Call: (415)885-6631. [Exp.#170.]

Berkeley PC Users Group—BPCUG. Meetings: 2nd and 4th Tues., 7:00 pm, Winner's Circle Systems, 2618 Telegraph Ave., Berkeley. Public domain library, newsletter, and separate Beginners Special Interest Group meeting. Contact: Mel Mann, (510)526-4033. [Exp.#166.]

Business Operations SIG of the Software Forum. Meetings: 1st Tues., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. Contact: Brian Tien, *brian@leansoft.com* . [Exp.#171.]

East Bay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Oakland. All microcomputers, MS-DOS, CP/M. Call: (510) 653-2627, 8 am–10 pm. [Exp.#171.]

Golden Gate Computer Society. Meetings: 4th Mon., 7:00 pm, San Rafael Community Center, 618 B St., San Rafael. Free intro to computers class at 6:00 pm. Call: (415)454-5556, or URL: *http://www.ggcs.org* . [Exp.#170.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm. Guests welcome. Call: Lee Schwab, (707)257-2675 or *editor@nvpcug.org* , or URL: *http://nvpcug.org/~nvpcug/* for details and location. [Exp.#166.]

PC Clubhouse. Meetings: 1st Fri., 7:30 pm, swap at 7:00 pm, Meiklejohn Hall, Room 2002 (inside 1009), CSU Hayward. Share knowledge and PD/shareware, mentor assistance, SIGs. Call: (510)276-6450 or 538-2449. [Exp.#168.]

PC Users Group Of The Redwoods. Meetings: 2nd Thurs., 6:30 pm, Santa Rosa Veteran's Memorial Building, East Dining Room, Maple Ave., Santa Rosa. Call: (707)527-USER; or *info@sonic.net* , or URL: *http://pcugr.pcugr.org* . [Exp.#169.]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: (415)593-9981, BBS (415)571-9259, or *larryw3553@aol.com* . [Exp.#170.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm, 110 Pacific, #153, San Francisco. For people who use computers in their work. Visitors $10. Call: (415)788-5338 or *sfbc@juno.com* . [Exp.#169.]

San Francisco PC Users Group. Meetings: 3rd Tues., 7:30 pm, PUC Auditorium, 505 Van Ness Ave./McAllister. Presentations, Q&A sessions. Call: Jerry Stern; (415)572-1100 or 777-1332 for recorded events message. URL: *http://www.sfpcug.org/~group* . [Exp.#171.]

INTERNATIONAL

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 7:00 pm, Apple Computer, R&D Campus, 1 Infinite Loop, Cupertino. A forum for multilingual/multiscript computing. $2; free for IMUG members. Call: Roger Sherman, (415) 859-5146. [Exp.#171.]

International Software SIG Of the Software Forum. Meetings: 3rd Mon., 7:00 pm, Stanford World Internet Center, Stanford Barn, Palo Alto. $10. Contact: Charlie Pfefferkorn, *charliep@crystal-media.com* . [Exp.#171.]

INTERNET

Internet SIG. Meetings: 3rd Thurs., 7:00 pm, PG&E Facility, 123 Mission St., San Francisco. Contact: Patrick Lynch, (510)482-5329, or *patl@a.crl.com* . [Exp.#170.]

LEGAL

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed. odd-numbered months, noon, 465 California St., 11th floor, Boardroom. Chair: Al Buchignani. Call: (415)421-5650. [Exp.#170.]

MACINTOSH

Association Of A32 Users. Meetings: 2nd Sat., 10:00 am, Sunnyvale Community Center Arboretum, 550 E. Remington Ave. (near corner of El Camino and Fair Oaks). Q&A session; guest speakers and vendor demonstrations; shareware, freeware, and PD software disks. Call: (408) 263-0398. [Exp.#166.]

BMUG User Group. Meetings: every Thurs., 6:30 pm, BMUG, 2055 Center St., Berkeley. Q&A, vendor demo and raffle. Free. Contact: (510)549-2684. [Exp.#168.]

BMUG User Group (San Francisco). Meetings: last Mon., 6:30 pm, McBean Theater in the Exploratorium. Q&A, vendor demo and raffle. Free. Contact: (510)549-2684. [Exp.#168.]

BMUG User Group (South Bay). Meetings: 3rd Mon., 7:00 pm, Apple Town Hall, Cupertino. Q&A, vendor demo and raffle. Free. Contact: (510)549-2684. [Exp.#168.]

Macintosh Users Group of the Napa Valley. Meetings: 2nd Thurs., 6:30 pm, Bel Aire Plaza on Trancas Ave., Napa. Contact: Jim Gillespie, (707)252-1665, *gillespi@napanet.net/* . [Exp.#168.]

Macs Of Marin. Meetings: last Wed., 8:00 pm, Corte Madera Rec. Center, 498 Tamalpais Dr., Marin. Q&A 8:00, meeting 8:30, members free, nonmembers $5. Call: Richard, (415) 485-5596. [Exp.#169.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 6:30 pm, Unitarian Church, 2124 Brewster (corner of Lowell), Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Roger, (415) 367-8657 or *rlakner@sirius.com* . [Exp.#166.]

MISCELLANEOUS

Bay Area Interleaf Users Group (Bayleaf). Meetings: 2nd Weds., odd-numbered months, Location varies; see Web site for details. Contact: Marilyn Salyer, (415)802-2170, *msalyer@interleaf.com* , or URL: *http://www.clearlink.com/bayleaf* . [Exp.#171.]

FileMaker Pro Database Interest Group (DIG.FM). Meetings: 3rd Thurs., 7:00 pm, Claris Corp., 5201 Patrick Henry Dr., Santa Clara. Presenta-tions, demos, and tips by and for passionate users of FileMaker Pro for both Mac and Windows. Not affiliated with Claris. Free. Contact: *info@digfm.org* , or URL: *http://www.digfm.org* . [Exp.#166.]

FoxPro 3rd Party Tools SIG. Meetings: 1st Thurs., 7:00 pm, PG&E Building, 77 Beale St., San Francisco. Contact: Barbara Paltiel, (415)345-0152. [Exp.#170.]

Marketing SIG Of The Software Forum. Meetings: 2nd Mon., 7:00 pm, Stanford World Internet Center, The Stanford Barn, 700 Welch, Ste. 200, Palo Alto. Contact: Stan Trumbull, *strum@bayarea.net* . [Exp.#171.]

SF Bay Area Powerbuilder Users Group. Meetings: 3rd Thurs., 1:00 pm. See Web site *(http://www.sfpbug.com)* for meeting location. All welcome. [Exp.#169.]

MOBILE

Stanford Newton User Group. Meetings: 2nd and 4th Tues., 7:00 pm, Printer's Inc. Bookstore Cafe, 310 California Ave., Palo Alto. Contact: Flash Sheridan, (415)462-9203, *snug@pobox.com* , or URL: *http://pobox.com/~snug/* . [Exp.#169.]

MULTIMEDIA

Multimedia SIG Of The Software Forum. Meetings: 4th Thurs., 7:00 pm, Cubberly Community Ctr., 4000 Middlefield Rd., Rm. H-1, Palo Alto. $10. Contact: Mike Schmit, *mschmit@ompcore.com* . [Exp.#171.]

NOVELL

Novell Users Group of Monterey. Meetings: 3rd Thurs., 6:30 pm, 40 Ragsdale Dr., in Ryan Ranch off of Hwy 68. Call: (408)645-2475. [Exp.#166.]

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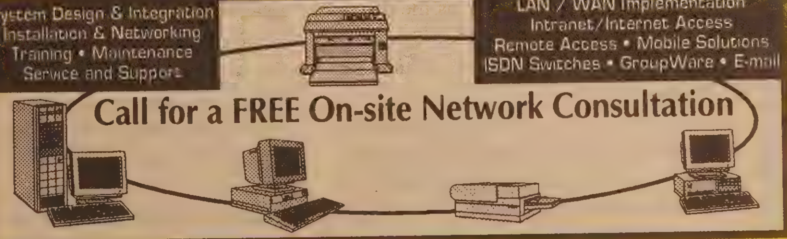

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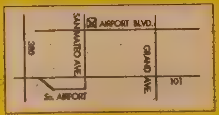

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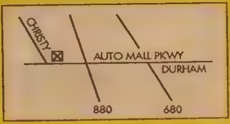

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OS/2

OS/2 Bay Area User Group. Meetings: 3rd Mon., 7:00 pm, Stanford Linear Accelerator Center Auditorium, 2575 Sand Hill Rd., Menlo Park. Free to members, non-members $3. Presentations, demonstrations, technical discussions. Call: (510) 945-7565 ext. 100, or URL: *http://www.davebsoft.com/os2baug*. [Exp.#166.]

PARADOX

Paradox SIG of Diablo Valley PC Users Group. Meetings: 2nd Thurs., 7:30 pm, Beginners and advanced, bring your PDOX problems. Free. Contact: Bill Mero, (510)685-2484, or *kmero @ix.netcom.com* [Exp.#170.]

PROGRAMMING LANGUAGES

Forth Interest Group, North Bay Chapter, and BMUG Forth SIG. Meetings: 2nd Sat., 1 pm, tutorial at noon, BMUG, 2055 Center St., Berkeley. Call: Leonard Morgenstern, (510)376-5241 or *nleonard@aol.com* [Exp.#166.]

Visual Basic Silicon Valley SIG of the Software Forum. Meetings: 2nd Thurs., 6:00 pm, Cubberly Community Ctr., 4000 Middlefield Rd., Rm. H-1, Palo Alto. $10. Call: Allan Colby, *storage@nerve-net.com*. [Exp.#171.]

VRML SIG of the Software Forum. Meetings: 3rd Tues., 7:00 pm, Cubberly Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Contact: Katherine Bretz, *kbretz@fsc.fujitsu.com* [Exp.#171.]

TEXAS INSTRUMENTS

TI-99/4A. Meetings: 2nd Sat., Oakland. Need soft-/hardware? Call: Fred, (510) 530-8335. [Exp.#169.]

WINDOWS

Bay Area Windows NT User Group. Meetings: 1st Sat., 1:00 pm, MentorNet, 745 Portola Dr., San Francisco. This professional association is for NT systems administrators and developers. Contact: Edwin Rutsch, (510)528-9895, or *edwin@wyp.net*, or URL: *http://www.bantug.org*. [Exp.#169.]

Windows NT Engineering Association of Silicon Valley (NTEA). Meetings: Second Tues., 6:00 pm, Santa Clara County Office of Education building, 1290 Ridder Park Dr., San Jose. Idea exchange, new technology, job opportunities. Meetings will focus on design, set-up, and troubleshooting servers, system administration, and software development issues. No fee for first-time participants. Contact: (408)437-8803. [Exp.#166.]

Windows SIG Of The Software Forum. Meetings: 1st Wed., 6:30 pm, Cubberly Community Ctr., 4000 Middlefield Rd., Rm. H-1, Palo Alto. Contact: Fran Finnegan, *fran@fomci.com* [Exp.#171.]

ASSOCIATIONS

Association For Women In Computing. Meetings: 1st Wed., 6:00 pm, standing room only, Crocker Galleria, 50 Post St., San Francisco. $10 members, $15 guests. Call: (415) 979-8450. [Exp.#171.]

Association of Database Developers (ADD–SF). URL: *http://www.well.com/user/add/cal.htm* [Exp.#170.]

MultiMedia & BEYOND

VIRTUAL PERU

continued from page 238

on the Fine Arts Museums site, has the link to Live Picture so you can load the RealVR Traveler plug-in enabling you to navigate the panorama in this Webtop VR.

"My next project," says Hart, "is to do the Virtual Legion of Honor. The idea will be to offer what in some ways will be better than the actual museum. We'll offer a virtual panorama in each room. Every object will be clickable and spinnable. The ceilings of the rooms will be fully-viewable spheres. We'll link all that in with some portion of our database that will allow you to go from one object to find and examine other related objects that are in the collection. We will make this into a CD-ROM and then we'll make some pages on the Web, either as a skeleton version, or we'll do a couple of complete galleries as highlights. We may also just turn it into a completely virtual thing on the Web and create a VRML gallery of highlights from the collection. We will experiment with different approaches." ■

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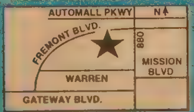

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PP-200C (INTEL VENUS M/B) ATX	154	648	838	868	938	1058	1038	1078	1158	1288
P5-200C (INTEL MARL M/B) ATX (Tucson: +$60)	98	358	548	578	648	768	748	788	868	998
P5-166C (INTEL MARL M/B) ATX (Tucson: +$60)	98	308	498	528	598	718	698	738	818	948
P5-150C (INTEL MARL M/B) ATX (Tucson: +$60)	98	248	438	468	538	658	638	678	758	888
P5-133C (INTEL MARL M/B) ATX (Tucson: +$60)	98	238	428	458	528	648	628	668	748	878
MMX-P233/512K (ASUS TX97)	154	778	918	948	1018	1138	1118	1158	1238	1368
MMX-P200/512K (ASUS TX97)	154	628	768	798	868	988	968	1008	1088	1218
MMX-P166/512K (ASUS TX97)	154	418	558	588	658	778	758	798	878	1008
P5-200/512K (ASUS VX97)	96	358	498	528	598	718	698	738	818	948
P5-166/512K (ASUS VX97)	96	298	438	468	538	658	638	678	758	888
P5-150/512K (ASUS VX97)	96	248	388	418	488	608	588	628	708	838
P5-133/512K (ASUS VX97)	96	228	368	398	468	588	568	608	688	818
P5-120/512K (ASUS VX97)	96	198	338	368	438	558	538	578	658	788
MMX-P233/512K (INTEL TRITON TX)	98	708	848	878	948	1068	1048	1088	1168	1298
MMX-P200/512K (INTEL TRITON TX)	98	578	718	748	818	938	918	958	1038	1168
MMX-P166/512K (INTEL TRITON TX)	98	368	508	538	608	728	708	748	828	958
AMD MMX-P200/512K (INTEL TRITON TX)	98	478	618	648	718	838	818	858	938	1068
AMD MMX-P166/512K (INTEL TRITON TX)	98	358	498	528	598	718	698	738	818	948
P5-200C (INTEL TRITON VX)	64	308	448	478	548	668	648	688	768	898
P5-166C (INTEL TRITON VX)	64	268	408	438	508	628	608	648	728	858
P5-150C (INTEL TRITON VX)	64	218	358	388	458	578	558	598	678	808
P5-133C (INTEL TRITON VX)	64	198	338	368	438	558	538	578	658	788
P5-120C (INTEL TRITON VX)	64	168	308	338	408	528	508	548	628	758
6X86-P200+ (INTEL TRITON TX)	98	208	348	378	448	568	548	588	668	798
6X86-P166+ (INTEL TRITON TX)	64	148	288	318	388	508	488	528	608	738
AMD K5-133C (INTEL TRITON VX)	64	138	278	308	378	498	478	518	598	728
AMD K5-75C (INTEL TRITON VX)	64	98	238	268	338	458	438	478	558	688
5X86-133C VLB-PCI	54	88	228	258	328	448	428	468	548	678

MOTHERBOARD W/O CPU

ASUS	
P55T2P4-Pentiumn 430 HX	$134
XXP55T2P4-430 HX ATX	138
P55TX97-Pentium 430 TX	158
P6NP5-Pentium Pro	228
XXP6NP5-Pentium Pro ATX	238
P65UP5D - Dual Pentium Pro 440FX	508
P55T2P4D - Dual Pentium 430HX	518
I-WILL TECHNOLOGIES	
MAP TV - Triton VX Ultra SCSI	208
MAP AV - Triton VX Ultra SCSI ATX	218
MAP TU - Triton HX UW SCSI	288
MAP AVW - Triton HX UW SCSI ATX	288
MAP XUW - Triton TX UW SCSI	318
P6NS - Pro, Natoma, UW SCSI	344
DP6NS - Dual Pro, Natoma UW SCSI	478
SUPERMICRO	
P55CMS - Pentium 430 FX	168
P5STDm - Pentium MMX 430 HX	148
P55STE - Pentium MMX 430 HX	158
P5MMS - Pentium MMX 430 TX	158
P6SNE - Pentium Pro 440 FX	248
P6DNE - Dual Pentium Pro	318
P6DNF - Pentium Pro Full AT	368
P6SKS - Pentium II SCSI	348
P6DKF - Dual Pentium II	408

HI-TECH DREAM SYSTEMS

(BUSINESS LEASE AVAILABLE)

- **8MB RAM** (16MB/32MB: Add $40/$100)
- **1.2GB EIDE** (2.0GB/4.3GB: Add $30/$90)
- **Diamond Stealth with 1MB**
- **33.6 Internal Fax Modem w/Voice**
- TEAC 1.44MB 3.5" Floppy Drive
- Mitsumi Keyboard for Windows 95
- Enhanced Case w/Power Supply
- Free Mouse and Microsoft Windows 95
- Monitor Sold Separately (please see next page)

Internet Ready!

MMX-P200/256K (Asus TX97)	$1088
MMX-P166/256K (Asus TX97)	888
MMX-P200/256K (Intel Triton TX)	1028
MMX-P166/256K (Intel Triton TX)	828
P5-200/256K (Intel Triton VX)	798
P5-166/256K (Intel Triton VX)	748
P5-150/256K (Intel Triton VX)	698
P5-133/256K (Intel Triton VX)	678
P5-120/256K (Intel Triton VX)	648
6X86-P200+/256K (Intel Triton VX)	678
6X86-P166+/256K (Intel Triton VX)	638
6X86-P150+/256K (Intel Triton VX)	628
AMD K5-P133/256K (Intel Triton VX)	618
AMD K5-P100/256K (Intel Triton VX)	608
AMD K5-P75/256K (Intel Triton VX)	578
5X86-133/256K PCI-VLB	558

See Next Page for All of Our Upgrade Prices

HI-TECH SUPER SYSTEMS

(BUSINESS LEASE AVAILABLE)

- **16MB EDO RAM** (32MB/64MB: Add $70/$200)
- **2.0GB EIDE** (4.3GB: Add $60)
- **Diamond Stealth w/2MB**
- **33.6 Int. Fax Modem w/Voice (Internet Ready)**
- TEAC 1.44MB 3.5" Floppy Drive
- Mitsumi Keyboard for Windows 95
- Medium Tower Case w/Power Supply
- Free Microsoft Windows 95 and Mouse
- Monitor Sold Separately (please see next page)

Pentium II-266 (Intel Portland) ATX	$1678
Pentium II-233 (Intel Portland) ATX	1548
Pentium II-266 (Asus or Super Micro)	1658
Pentium II-233 (Asus or Super Micro)	1528
MMX-P200/256K (Asus TX97)	1178
MMX-P166/256K (Asus TX97)	968
P5-200/256K (Asus TX97)	958
P5-166/256K (Asus TX97)	908
P5-150/256K (Asus TX97)	848
MMX-P200 (Intel Triton TX)	1118
MMX-P166 (Intel Triton TX)	908
P5-200/256K (Intel Triton TX)	898
P5-166/256K (Intel Triton TX)	848
P5-150/256K (Intel Triton TX)	798
P5-133/256K (Intel Triton TX)	778
P5-120/256K (Intel Triton TX)	758

See Next Page for All of Our Upgrade Prices

HI-TECH POWER SYSTEMS

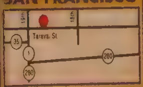
(BUSINESS LEASE AVAILABLE)

- **32MB EDO RAM** (64MB: Add $140)
- **4.3GB EIDE Hard Drive** (6.4GB: Add $130)
- **Matrox Mystique PCI w/4MB SGRAM**
- **US Robotics 56.6 Fax Modem (Internet Ready)**
- TEAC 1.44MB 3.5" Floppy Drive
- Keytronics Keyboard for Windows 95
- Medium Tower Case or w/Power Supply
- Free Microsoft Windows 95 and Mouse
- Monitor Sold Separately (please see next page)

Pentium II-266 (Intel Portland) ATX	$1948
Pentium II-233 (Intel Portland) ATX	1818
Pentium II-266 (Asus or Super Micro)	1928
Pentium II-233 (Asus or Super Micro)	1798
Dual PP-200 (Super Micro) w/1CPU	1638
Dual PP-180 (Super Micro) w/1CPU	1498
PP-200 (Super Micro)	1568
PP-180 (Super Micro)	1428
PP-200 (Intel Venus) ATX	1518
PP-180 (Intel Venus) ATX	1378
MMX-P233/512K (Asus TX97)	1588
MMX-P200/512K (Asus TX97)	1458
MMX-P166/512K (Asus TX97)	1258
P5-200/256K (Intel Marl) ATX	1218
P5-166/256K (Intel Marl) ATX	1168
P5-150/256K (Intel Marl) ATX	1108

See Next Page for All of Our Upgrade Prices

SAN FRANCISCO



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E. 5th Ave
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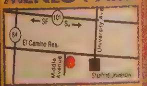
San Mateo, CA 94401 Fax (415) 401-6818

MENLO PARK



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Remington
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Lawrence Expwy

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Centre Pointe Dr
Great Mall Parkway
680
Montague Expressway

Phone (408) 262-8688
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SALES HOURS: Mon-Fri: 8:30am-6pm, (9:30am-7pm Sunnyvale), Sat: 10am-4pm
SERVICE HOURS: Mon-Fri: 9am-5:30pm, Sat: 10am-3:30pm [illegible]

DISCOVER

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TERMS AND CONDITIONS

1. One year parts and labor warranty on systems.
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3. Prices and availability subject to change w/o notice.
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5. Return shipping must be insured, prepaid and bearing an RMA# on the shipping label.
6. Defective items replaced or repaired at our discretion.
7. No responsible for typos.
8. All returns subject to 15% restocking fee and cover only Hi-Tech USA brand computers, excludes peripherals, software and notebook computers. No refunds after 30 days.
9. Superior reputation for service, quality and value.
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CASE W/POWER SUPPLY

230W / 250W / 300W Power Supply	$21 / 24 / 34
Mini Tower Case w/200W Power Supply	24
Desktop AT Case w/200W Power Supply	34
Medium Tower Case w/230W Power Supply	36
Full Tower Case w/250W Power Supply	50
ATX Case w/Power Supply (Tower / AT)	67 / 87

CONTROLLERS

IDE 2FD/2HD with 2S/1P/1G	$10
VLB EIDE I/O with 16550	15

adaptec

1522 / 1542 CP (SCSI)	$68 / 164
2842 VLB (SCSI)	98
2940U PCI (SCSI)	165
2940UW PCI / 2940UWK (SCSI)	190 / 204

DATA TECHNOLOGY CORPORATION

DTC 2280E ISA with 16550 UART Chip	$19
DTC 2278E VLB IDE W/16550 UART Chip	23

PROMISE TECHNOLOGY, INC.

Promise DC-2300 Plus VLB IDE Fast I/O	$41
Promise DC-4030 VLB IDE Cache Controller	58
Promise DC-4030+ VLB EIDE	106
Promise DC-5030 PCI IDE 0-16MB Cache	98

HARD / FLOPPY DRIVES

Quantum™ Maxtor® Seagate Micropolis Conner
Western Digital

IDE 1.0GB / 1.2GB / 1.6GB	$139 / 148 / 168
IDE 2.0GB / 2.5GB	174 / 188
IDE 4.3GB / 6.4GB	228 / 348
SCSI 1.0GB / 1.2GB / 2.0GB	198 / 208 / 264
SCSI 4.0GB / 9.0GB	688 / 1198
FUJITSU IDE 1.2GB / 1.7GB	154 / 178
FUJITSU IDE 2.1GB / 2.5GB	198 / 214
JTS IDE 1.0GB / 1.2GB	139 / 148
JTS IDE 1.7GB / 2.0GB	168 / 174
MAXTOR IDE 2.5GB	218
QUANTUM	
IDE 1.2GB / 1.7GB / 2.5GB	175 / 185 / 188
IDE 3.1GB / 4.3GB / 6.4GB	218 / 228 / 348
SCSI 1.0GB / 1.2GB	198 / 208
SCSI 2.0GB / 4.0GB	264 / 688
SAMSUNG	
IDE 2.0GB	174
SEAGATE	
IDE 1.2GB/ 1.6GB / 2.0GB	164 / 168 / 178
WESTERN DIGITAL	
IDE 1.0GB / 1.6GB	158 / 178
IDE 2.0GB / 2.5GB / 4.0GB	194 / 208 / 308
FLOPPY DRIVES	
1.44 Floppy Drive	$19
Teac 1.44 Floppy Drive	21

MOUSE

3-Button Mouse Microsoft Compatible	$5

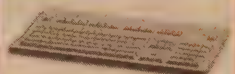
LOGITECH

First Mouse (Serial-2 Button)	9
Mouseman Serial / PS2 (OEM)	17 / 20

Microsoft

Microsoft Mouse Serial (w/System)	$20
Microsoft Mouse PS2 (w/System)	22

KEYBOARDS

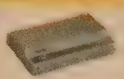


101 Enhanced Keyboard for Windows 95	$11
FOCUS	
FK2001 for Windows '95	25
FK6200W/7200W	19 / 25
FK8200 / 9200	32 / 40
Keytronics 104-Key for Windows 95	15
Lite-on SK-6000 / SK-6000T	35 / 52
Mitsumi 104-Key for Windows 95	11
Maxiswitch Nova for Windows 95	17
Maxiswitch Nova PS/2	18
Microsoft Natural Key (w/System)	44
Northgate OMNI 102 or Ultra	38

MEMORY & CPU

SIMM	
1MB (1x3) (30 Pin)	7
4MB (4x3) (30 Pin)	19
4MB (1x32) (72-Pin)	19
8MB (2x32) (72-Pin)	35
16MB (4x32) 72-Pin)	63
32MB (8x32) (72-Pin)	126
4MB (1x32) (EDO)	19
8MB (2x32) (EDO)	36
16MB (4x32) (EDO)	64
32MB (8x32) (EDO)	126
CPU	
AMD 5X86-133	38
AMD K5-P75 / 100 / 133	29 / 60 / 69
6X86 P-150+/P-166+/P-200+	78/ 90 / 128
Intel P5-90 / 120 / 133	88/ 108 / 132
Intel P5-150 /166 / 200	146 / 206 / 250
Intel Pentium Pro-150 / Pro-180	178 / 398
Intel Pentium Pro-200	496
Intel MMX-166 / 200 / 233	268 / 478 / 618

MODEMS & FAXES



Fax Modem 14,400 Internal / External	$23 / 34
Fax Modem 96/24 Internal	25
Fax Modem 28.8 with V.34 Ext	44
Fax Modem 33.6 with V.34 Int	46
Fax Modem 33.6 with V.34 Ext	68
Fax Modem 33.6 with Voice Int	52
Fax Modem 33.6 with Voice Ext	72
PCMCIA Fax Modem 28.8 Data w/V.34	68
PCMCIA Fax Modem 33.6 Data w/V.34	94
SUPRA 33.6 Fax Modem Int (Bulk)	58
SUPRA 33.6 Fax Modem w/Voice Int (Retail)	92
SUPRA 56.6 Fax Modem w/Voice Int	114
US ROBOTICS	
Sportster 14,400 FM Int Si	$28
Sportster 14,400 FM Int (Classic)	38
Sportster 28.8 Winmodem (Bulk)	48
Sportster 33.6 Data Winmodem Int (Bulk)	68
Sportster 33.6 Data Winmodem Int (Retail)	86
Sportster 28.8 FM with Voice Int	74
Sportster 28.8 FM with Voice Ext	108
Sportster 33.6 Data Fax Modem Int (Bulk)	86
Sportster 33.6 Data Fax Modem (Retail)	118
Sportster 33.6 Data Fax modem w/Voice Int (Bulk)	95
Sportster 33.6 Data Fax Modem w/Voice Int (Retail)	138
Sportster 33.6 Data Fax Modem w/V.34 Ext (Retail)	140
Sportster 33.6 Data Fax Modem w/Voice Ext	158
Sportster 56.6 Internal (Bulk)	146
Sportser 56.6 Internal (Retail)	160
Sportster 56.6 External (Retail)	178

MONITORS*

14" Mono / VGA Mono	$78 / 88
14" SGA 1024•768 .28 NI	148
15" SVGA 1024•768 .28	198
17" SVGA 1280•1024 .28	392

CTX

14" Super VGA 1024•768 .28 NI	$193
15" Super VGA 1024•768 .28	262
17" Super VGA 1280•1024 .28	464

IIYama (IDEK)

MF-8515 15" 1280•1024 .28	$334
MF-8617E 17" 1600•1200 .26	584
MF-8221E 21" 1600•1200 .30	1354

Impression

14" 1024•768 .28 NI	$158
15" 1280•1024 .28 NI	236
17" 1280•1024 .28 NI	433

MAG INNOVISION

510V 15" 1280•1024 .28	$274
1595 15" 1280•1024 .28	282
DX15T 15" .25 Trinitron OSD Win 95	328
710V² 17" 1280•1024 .28	458
DJ700 17" .26 1280•1024	522
DJ702 17" .26 1280•1024	523
DX700T 17" .25 Trinitron OSD Win 95	604

NANAO®

FX-B5 15" .28 / FX-C5 17" .28	492 / 684
FX-C6 17" .26 / TX-C7S 17" .25	768 / 954
T2-17 .25	868
TX-D7S 20" .25 / FX-E7 21" .28	1604 / 1604

NEC

XV 15+ / M500	$352 / 374
M700 / XV 17+ / P750	728 / 643 / 834
XE 21 / E1100 21" .28	1548 / 1488

NOKIA

449E 15" / 447L 17"	$412 / 586
447XAV 17" / 447K 17"	934 / 1374
445XI 21"	1688

SONY

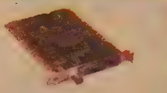
100SX 15"	$344
100SF 15"	384
200SX 17" 1280•1024 .25 65 Hz	618
200SF 17" 1280•1024 .25 75 Hz	724
300SFT 20" 1600•1024 .31	1516
20SE2T 20" .25	1758

ViewSonic®

E641 14" 1024•768 .28	$208
E655 15" 1024•768 .28	278
15GS 15" 1280•1024 .28	324
15GA 15" 1280•1024 .27 w/Speakers	364
17EA 17" 1280•1024 .28 w/Speakers	528
17GS 17" 1280•1024 .28 Green	534
17GA 17" 1280•1024 .27 w/Speakers	588
17PS 17" 1600•1280 .25 Green	648
GT770 17" 1280•1024 .25	624
PT770 17" 1600•1280 .25	654
PT775 17" 1600•1280 .25	738
G800 20" 1600•1280 .28	988
GT800 20" 1600•1280 .30	1098
G810 21" 1600•1280 .25	1248
PT 813 21" 1600•1280 .28	1428
P815 21" 1800•1440 .25	1478

* Monitor Viewable size may be smaller than advertised size

NETWORKS



16 BIT Ethernet Card ISA (Combo)	$14
16 PCI Ethernet Hub (Combo)	19
PCMCIA Ethernet Card (Combo)	70

3Com

3C509 ELINK III TP	$47
3C509 ELINK III Combo	69
3C590 PCI Combo	69
3C900 PCI TP (New)	67
3C900 PCI Combo (New)	82
3C905 TX PCI 10 / 100	65

Hubs and Repeaters

5-Port Ethernet Hub	$41
8-Port Ethernet Hub	47
16-Port Ethernet Hub	100

Intel

EtherExpress Pro 10 / 100 TX PCI	$55

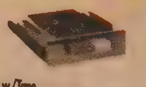
SCANNERS

Adara Scan 016 Image Star I	$218
Visioneer PK-33001-W PPVX 3.5	238

SOFTWARE

Microsoft Windows 95 Full Copy CD Version (w/system)	$89
Microsoft Windows 95+ (with System)	129
Microsoft DOS 6.x (with System)	38
Microsoft Office Professional OEM CD Version (w/System)	178
Microsoft Windows 3.x (with System)	58
Microsoft Windows for Workgroup (with System)	64
Microsoft Windows NT 4.0 Server	
5 Clients (with/System)	448
10 Clients (with/System)	608
Microsoft Windows NT 4.0 Workstation (with Sys)	144

TAPE BACKUPS



Teac 800MB w/Tape	$52

COLORADO MEMORY SYSTEMS

DJ-35 350MB Int	38
T-1000E 800MB External w/tape	142
T-3000T 3.2GB Int. w/tape	154
T-4000T 8.0GB SCSI Int w/tape	335
Tape for 800MB	29
IOMEGA	
Ditto Easy 800 Insider	96
Ditto Easy 800 Parallel	122
Ditto Easy 3200 Insider w/Cartridge	214
Ditto 800/3200 Cartridge	30 / 35
Jaz SCSI Drive 1.0GB Insider	344
Jaz SCSI Drive 1.0GB External	428
Jaz SCSI Drive Cartridge	94
Zip Drive 100MB External Parallel	133
Zip Drive 100MB External SCSI	133
Zip Drive 100MB Cartridge	15
ZIP DRIVES (Epson)	
100MB External Parallel	$118

VGA CARDS

MGP Card	$10
VGA 512K	18
SVGA ISA w/1MB	25
Cirrus Logic PCI w/1MB	21
Cirrus Logic PCI w/MPEG 1MB	24
Trident PCI w/1MB	22
Trident PCI w/1MB MPEG	25

ATI TECHNOLOGIES INC.

3D Xpression 2MB EDO	$55
3D Xpression+ w/o TV 2MB	81
3D Xpression+ w/o TV 4MB	91
3D Xpression+ w/ TV 2MB	93
3D Xpression+ w/ TV 4MB	107
ProTurbo w/TV 4MB SGRAM	133
ProTurbo w/TV 8MB SGRAM	173
VideoBoost PCI 1MB DRAM w/MPEG	45
VideoBoost PCI 2MB DRAM w/MPEG	52
TV Tuner	115

DIAMOND

Stealth 2500 with MPEG 1MB	28
Stealth 2500 with MPEG 2MB	38
Stealth 64 PCI 2MB (DRAM)	54
Stealth 64 Video PCI 2MB (VRAM)	98
Stealth 64 Video PCI 4MB (VRAM)	140
Stealth 64 VLB 2MB (VRAM)	98
Stealth 3D 2000 PCI 2MB	54
Stealth 3D 2000 PCI 4MB	82
Stealth 3D 3000 PCI 2MB (VRAM)	104
Stealth 3D 3000 PCI 4MB (VRAM)	144
Fire GL1000 4MB (Bulk)	244
Fire GL1000 4MB (Retail)	268
Fire GL1000 8MB (Bulk)	308
Fire GL1000 8MB (Retail)	348

MATROX

Millennium PCI 2MB (WRAM) (Bulk)	131
Millennium PCI 4MB (WRAM) (Bulk)	161
Millennium PCI 2MB (WRAM) (Retail)	154
Millennium PCI 4MB (WRAM) (Retail)	176
Mystique PCI 2MB (SGRAM) w/o Game (Bulk)	88
Mystique PCI 4MB (SGRAM) w/o Game (Bulk)	111
Mystique PCI 2MB (SGRAM) (Retail)	108
Mystique PCI 4MB (SGRAM) (Retail)	132

Number 9

Imagine 128 S2E PCI 4MB	258
Imagine 128 Series 2 PCI 4MB	398

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MOTHERBOARD W/CPU

5X86-133/256K PCI-VLB	$98
AMD K5-P75/256K (Triton VX)	108
AMD K5-P100/256K (Triton VX)	138
AMD K5-P133/256K (Triton VX)	148
6X86-P166+/256K (Triton VX)	158
6X86-P200+/256K (Triton VX)	218
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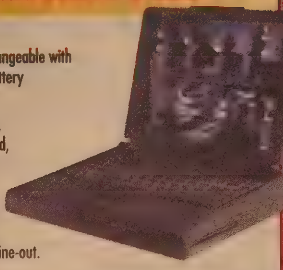

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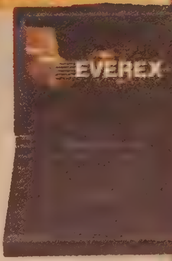

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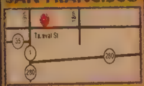

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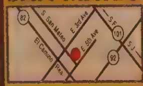

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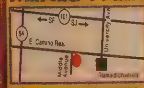

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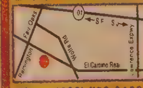

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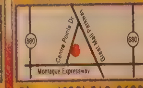

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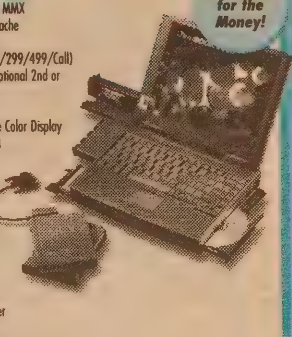

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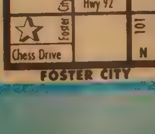

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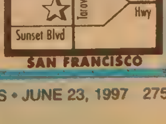

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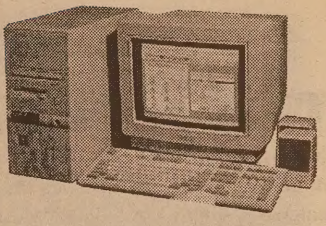

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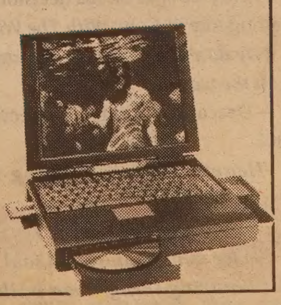

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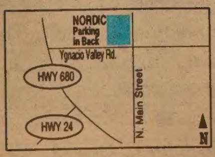

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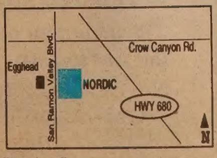

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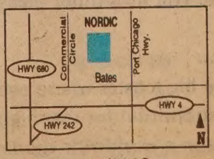

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DVORAK'S LAST COLUMN • BY JOHN C. DVORAK

The Best Net Humor Of 1996

Or, Somebody Has To Promote This Stuff

This column salutes the best Net Humor that floated around the Internet last year. I've observed that this year's material is simply not as good. Most people on the Net become part of a giant joke transference system, and many of these gags have passed through thousands of desktops.

Here are a couple of items to which I present the *MicroTimes* Best Humor Award. Will the authors please claim the award!

Most Useful Humor

The first award goes to a posting of useful dumb quotes that can spruce up any speech, to wit:

"Computers in the future may weigh no more than 1.5 tons."

—*Popular Mechanics*, forecasting the relentless march of science, 1949

"I think there is a world market for maybe five computers."

—Thomas Watson, chairman of IBM, 1943

"There is no reason anyone would want a computer in their home."

—Ken Olsen, president, chairman and founder of Digital Equipment Corp., 1977

"The concept is interesting and well-formed, but in order to earn better than a 'C,' the idea must be feasible."

—A Yale University management professor in response to Fred Smith's paper proposing reliable overnight delivery service. (Smith went on to found Federal Express Corp.)

"Who the hell wants to hear actors talk?"

—H.M. Warner, Warner Brothers, 1927.

"I'm just glad it'll be Clark Gable who's falling on his face and not Gary Cooper."

—Gary Cooper on his decision not to take the leading role in *Gone With The Wind.*

"We don't like their sound, and guitar music is on the way out."

—Decca Recording Co. rejecting the Beatles, 1962.

"Heavier-than-air flying machines are impossible."

—Lord Kelvin, president, Royal Society, 1895.

"So we went to Atari and said, 'Hey, we've got this amazing thing, even built with some of your parts, and what do you think about funding us? Or we' ll give it to you. We just want to do it. Pay our salary, we'll come work for you.' And they said, 'No.' So then we went to Hewlett-Packard, and they said, 'Hey, we don't need you. You haven't got through college yet.'"

—Apple Computer Inc. founder Steve Jobs on attempts to get Atari and HP interested in his and Steve Wozniak's personal computer.

"Professor Goddard does not know the relation between action and reaction and the need to have something better than a vacuum against which to react. He seems to lack the basic knowledge ladled out daily in high schools."

—1921 *New York Times* editorial about Robert Goddard's revolutionary rocket work.

"Stocks have reached what looks like a permanently high plateau."

—Irving Fisher, Professor of Economics, Yale University, 1929.

"Everything that can be invented has been invented."

—Charles H. Duell, Commissioner, U.S. Office of Patents, 1899.

"Louis Pasteur's theory of germs is ridiculous fiction".

—Pierre Pachet, Professor of Physiology at Toulouse, 1872

"640K ought to be enough for anybody."

— Bill Gates, 1981

Numerous so-called quotes were removed from this list because there was no genuine attribution. Those kinds of quotes tend to be pure folklore.

Best Analogy-Type Net Gag

This type of joke comes around each year and is derived from the old gags designed around a doll. You know—"If IBM made a doll it would run Cobol. Or if you wound it up it would move to Armonk." That kind of thing.

This is the famous Toasters Joke that ran around the Net last year. Will the author please come forward....

If IBM made toasters...

They would want one big toaster where people bring bread to be submitted for overnight toasting. IBM would claim a worldwide market for five, maybe six toasters.

If Microsoft made toasters...

Every time you bought a loaf of bread, you would have to buy a toaster. You wouldn't have to take the toaster, but you'd still have to pay for it anyway. Toaster 95 would weigh 15,000 pounds (hence requiring a reinforced steel counter top), draw enough electricity to power a small city, take up 95% of the space in your kitchen, would claim to be the first toaster that lets you control how light or dark you want your toast to be, and would secretly interrogate your other appliances to find out who made them. Everyone would hate Microsoft toasters, but nonetheless would buy them since most of the good bread only works with their toasters.

If Apple made toasters...

It would do everything the Microsoft toaster does, but 5 years earlier.

If Xerox made toasters...

You could toast one-sided or double-sided. Successive slices would get lighter and lighter. The toaster would jam your bread for you.

If Radio Shack made toasters...

The staff would sell you a toaster, but not know anything about it. Or you could buy all the parts to build your own toaster.

If Oracle made toasters...

They'd claim their toaster was compatible with all brands and styles of bread, but when you got it home you'd discover the Bagel Engine was still in development, the Croissant Extension was three years away, and that indeed the whole appliance was just blowing smoke.

If Sun made toasters...

The toast would burn often, but you could get a really good cup of Java.

Does DEC still make toasters?...

They made good toasters in the '80s, didn't they?

If Hewlett-Packard made toasters...

They would market the Reverse Polish Toaster, which takes in toast and gives you regular bread.

Send in your nominations for the Net Joke of the Year Awards. Put me on your "A" list for great Net humor at *dvorak@aol.com* . Also visit *http://www.dvorak.org* . ■

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